



# Posthospital Care Before and After the Medicare Prospective Payment System

C. R. Neu, Scott C. Harrison

*40 Years*  
1948-1988

REPORTS

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# Posthospital Care Before and After the Medicare Prospective Payment System

C. R. Neu, Scott C. Harrison

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## PREFACE

The analyses described in this report were conducted as a part of the research program of the RAND/UCLA Center for Policy Research on Health Care Financing, in support of Health Care Financing Administration (HCFA) efforts to prepare a congressionally mandated report on the impact of the Medicare prospective payment system (PPS) on posthospital care. The principal object of these analyses has been to describe changes in the use of and the charges for Medicare-reimbursed skilled nursing and home health care from the period shortly before the introduction of the Medicare PPS to the period immediately following it.

These analyses have used data bases, constructed by RAND, linking together Medicare billing records for hospital and posthospital care. This linking of records from different sources has not been carried out elsewhere on a large scale, and this report and a previous RAND report<sup>1</sup> provide the first systematic descriptions of patterns of Medicare hospital and posthospital care. The present report contains numerous statistical tables describing these care patterns—perhaps more tables than will be useful to a casual reader. Because little information about hospital and posthospital care patterns has been available previously, however, we thought it worthwhile to include these tables, even at the risk of reducing the readability of the report.

The authors gratefully acknowledge the contributions of their RAND colleagues Sally Trude, Daniel Byrne, and Syam Sarma, who accomplished most of the very demanding data processing chores associated with this research. The authors are also grateful to their colleagues Joan Buchanan and Susan Marquis for many helpful comments and suggestions on an earlier draft of this report.

This research was supported under a HCFA Cooperative Research Agreement.

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<sup>1</sup>C. R. Neu and Scott Harrison, *Prospective Payment for Medicare Posthospital Services: Some Empirical Considerations*, The RAND Corporation, R-3435-HCFA, December 1986.





## SUMMARY

With the introduction of the Medicare prospective payment system (PPS) in 1983, hospitals faced strong new incentives to discharge Medicare patients as rapidly as possible. The PPS also provided new encouragement for the use of posthospital care provided by skilled nursing facilities (SNFs) and home health agencies (HHAs): Hospitals could reduce lengths of stay in some cases by discharging patients to some form of posthospital care.

Anecdotal evidence suggests that, faced with these new incentives, acute-care hospitals have been discharging Medicare patients "quicker and sicker," and concerns have been raised over how these changes in care patterns have affected quality of care and the costs of an overall episode of care. Questions have also been raised about the adequacy of current Medicare policies for reimbursing SNF and home health care: If Medicare patients are requiring more extensive or more expensive posthospital care, perhaps these reimbursement policies should be adjusted. This report seeks to document the changes in Medicare hospital and posthospital care patterns that have occurred since the introduction of the PPS.

## THE DATA

The data for these analyses come principally from hospital billing records for 20 percent random samples of all Medicare beneficiaries discharged from short-stay, acute-care hospitals during two 12-month periods: calendar year 1981 (shortly before institution of the PPS) and the 12 months ending in June 1985 (roughly the first year of the fully implemented PPS). To these records of inpatient hospital care, we have appended records from other Medicare data files providing information on SNF and home health care. For the 1984/85 period, we have also appended records of care in rehabilitation hospitals and units that follows an episode of acute hospital care. (Rehabilitation care cannot be clearly identified in the data from the earlier period.) The resulting data bases contain information on all Medicare Part A services provided to a Medicare beneficiary during episodes of care that begin with a stay in an acute-care hospital.

In general, we have excluded from our samples patients originally discharged from facilities that were exempted from the Medicare PPS (rehabilitation hospitals and units, psychiatric hospitals and units,

long-stay hospitals, children's hospitals, and health maintenance organization (HMO) hospitals). For most of our analyses, we have also excluded patients discharged from hospitals in the four states (Maryland, Massachusetts, New Jersey, and New York) that had been granted waivers from the Medicare PPS during the 1984/85 period.<sup>1</sup> Our rationale is that the experience of patients discharged from hospitals not operating under the PPS is irrelevant to an inquiry into the possible effects of the PPS. After making these exclusions, each of our samples includes information on about 1.7 million Medicare hospital discharges and their subsequent posthospital care.

## OVERALL PATTERNS OF HOSPITAL AND POSTHOSPITAL CARE

Table S.1 summarizes the changes in the overall patterns of hospital and posthospital care from the pre- to the post-PPS periods. Certainly, Medicare patients are being discharged from acute-care hospitals more quickly. The average hospital length of stay for patients in our samples declined from 9.8 to 7.8 days. The fraction of patients using SNF care increased, but those who used SNF care had fewer covered days of care on average. There was a more pronounced increase in the fraction of patients who used home health care, and the average number of home health visits per user also increased.<sup>2</sup>

It seems that posthospital care—and particularly SNF care—is becoming more routine, less “chronic” in nature. In particular, there is evidence that “marginal” patients—patients who previously would not have used posthospital care—are doing so now, perhaps allowing their discharge from acute-care hospitals a few days earlier. The “additional” users of SNF care in the post-PPS period, for example, are concentrated at the low end of the distribution of SNF lengths of stay. These patients apparently need only a few days of SNF care (at least, they are getting only a few days of SNF care) and might previously simply have stayed in the hospital for a few more days. Also, the decline in average hospital length of stay is more pronounced for those patients who actually used either SNF or home health care than for the general population of Medicare hospital patients. Finally, propensity to use posthospital care has increased most for younger Medicare patients, who typically have used relatively little posthospital care.

<sup>1</sup>Only New Jersey and Maryland still have these waivers.

<sup>2</sup>Medicare policies on home health care were liberalized in mid-1981, and at least a part of the increase in home health care use that is apparent in the table is doubtless due to factors other than the introduction of the PPS.



Table S.1

## HOSPITAL AND POSTHOSPITAL CARE IN NONWAIVERED STATES

Item	Discharges in	
	1981	1984/85
Hospital Care		
Total Medicare discharges from short-stay hospitals	1,679,405	1,690,644
Average covered charges per discharge	\$3,391	\$4,902
Average length of stay	9.8 days	7.8 days
Average covered charges per day	\$346	\$627
SNF Care		
Number of users	41,739	53,242
Percentage of discharges using SNF care	2.5%	3.1%
Average covered charges per user	\$2,359	\$2,873
Average covered charges per hospital discharge	\$59	\$90
Average covered days per user	29.6 days	25.1 days
Average covered charges per covered day	\$80	\$114
Home Health Care		
Number of users	143,128	225,442
Percentage of discharges using home health care	8.5%	13.3%
Average covered charges per user	\$508	\$756
Average covered charges per hospital discharge	\$43	\$101
Average visits per user	12.8	14.1
Average covered charges per visit	\$40	\$54

If Medicare hospital patients are in fact being discharged "quicker and sicker," we might expect to see more readmissions to the hospital from SNF care in the post-PPS period. Interestingly, we observe just the reverse. The death rate among Medicare SNF patients has also declined. (Because our data do not allow us to fix accurately the date on which home health care ends, we cannot make similar comparisons for home health care patients.)

## POSTHOSPITAL USE AND CHARGES BY DRG

Patients in a relatively few diagnosis related groups (DRGs) account for the bulk of Medicare outlays for posthospital care, and many of the same DRGs are important for both SNF and home health care. (The six most important DRGs for SNF care in our 1984/85 sample, for example, were also the six most important DRGs for home health care.) Changes in which DRGs account for the largest shares of posthospital outlays between 1981 and 1985/85 seem to be due more to changes in the DRG composition of the general Medicare hospital population than to any changes in posthospital care patterns for patients in particular DRGs.

The trends noted for all Medicare hospital discharges in Table S.1 generally hold for individual DRGs. For nearly all of the DRGs that are "important" for posthospital care, propensities to use both SNF and home health care increased, the average number of covered SNF days declined, and the average number of home health visits increased. More broadly, changes in the use of and charges for posthospital care were roughly the same for patients in surgical DRGs as for patients in medical DRGs. Overall changes in care patterns, then, reflect real changes in the ways that Medicare patients are being treated, not simply changes in the case mix of the underlying Medicare population.

## STATE-TO-STATE VARIATIONS IN POSTHOSPITAL CARE

Introduction of the PPS seems to have done nothing to reduce the wide variations from state to state in the incidence of, the extent of, and the charges for posthospital care. If anything, these variations increased from the pre- to the post-PPS periods. Further, the national trends in posthospital care patterns reflected in Table S.1 are not characteristic of all states. Our analysis suggests that differences from state to state in the age/sex/DRG distribution of Medicare hospital patients explain only a very small fraction of the observed state-to-state variation in posthospital care use and costs. The latter differences appear to reflect underlying differences from one state to another in the way that patients of particular types are treated. We do not yet understand what gives rise to these differences in treatment patterns.

Variations in the patterns of posthospital care constitute a crude natural experiment on the relationships between different types of posthospital care and between hospital and posthospital care. There is no indication, for example, that SNF and home health care are either substitutes or complements. States with high use of one type of care

do not have either unusually high or unusually low use of the other. Neither did states that experienced large changes in the use of one have particularly large or small changes in the use of the other.

Neither is there an apparent relation between the use of SNF care and the average length of hospital stays in a state. There is, however, a marked negative relation between the use of SNF care in a state and average hospital lengths of stay *for patients who subsequently used SNF care*. (This relationship is apparent both in absolute levels and in percentage changes from the pre- to the post-PPS periods.) This suggests that increased use of SNF care may be substituting for hospital care in part because the greater availability of SNF care reduces the time that Medicare patients spend in hospitals waiting for an SNF bed.

There is a clear *positive* correlation between home health care use in a state and average hospital lengths of stay. Thus, there is no evidence that increased use of home health care is substituting for hospital care. Indeed, the evidence suggests just the opposite. Neither is there any indication that Medicare patients are queued up waiting for home health care. Unlike the situation for SNF care, there is no relationship (in either levels or percentage changes) between use of home health care and hospital lengths of stay for patients who subsequently used home health care.

## PATIENT-LEVEL ANALYSES

Another way to search for evidence that increased use of posthospital care may be substituting for hospital care is to ask whether patients who use posthospital care have shorter hospital stays than similar patients who do not. Our data limit us to using only the DRG to identify "similar" users and nonusers of posthospital care. Because we cannot distinguish among different severities of illness within a DRG, we observe a positive relationship between use of posthospital care and hospital length of stay. Presumably, patients with more severe conditions in a particular DRG are more likely to use posthospital care and will also have longer hospital stays. Comparisons of data from 1981 with data from 1984/85, however, show that this positive relationship was weaker in the later period, suggesting that attempts by hospitals to use posthospital care as a substitute for the last few days of hospital care were partially offsetting the positive bias introduced by our inability to control for severity of illness.



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## I. INTRODUCTION

The institution, in 1983, of the Medicare prospective payment system (PPS) for reimbursing inpatient hospital services changed the financial incentives that a hospital faces when caring for Medicare patients. In particular, it changed the incentives that a hospital faces when deciding whether to keep a Medicare patient in the hospital for a few more days or to discharge him or her to some form of posthospital care. (More accurately, the PPS has changed hospitals' incentives in trying to influence physicians, for it is physicians who ultimately choose courses of treatment for individual patients.) Under the previous cost-based system of hospital reimbursement, hospitals generally had an incentive to keep Medicare patients in the hospital. Medicare reimbursed most of the costs of treating a patient for a few more days; and unless the bed vacated by a departing Medicare patient were immediately filled by a new patient, the hospital would lose revenue necessary to cover fixed overhead costs. The PPS, in contrast, gives hospitals an incentive to discharge Medicare patients as soon as possible. In most cases, Medicare now pays a fixed amount for the inpatient care of a Medicare beneficiary.<sup>1</sup> The hospital can keep any cost savings that it may achieve (perhaps through prompt discharge) in treating a Medicare patient. The sooner one Medicare patient is discharged, the sooner the hospital can admit another, thereby earning another fixed payment.

These new incentives encourage hospitals to make greater use of posthospital care provided by skilled nursing facilities (SNFs) and home health agencies (HHAs). If Medicare patients who otherwise would have remained in the hospital can be transferred to posthospital care, hospitals can reduce their costs with no loss of revenue. Anecdotal evidence has it that, since the establishment of the PPS, hospitals have been discharging Medicare patients "quicker and sicker" to SNF and home health care and that these patients now require more and more intensive posthospital care.

If Medicare patients are indeed being discharged "quicker and sicker" from acute-care hospitals, a variety of potentially difficult policy questions arise. Have changing patterns of care brought changes in the quality of care? Have earlier discharges from acute-care hospitals

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<sup>1</sup>The current PPS provides for supplemental "outlier" payments on behalf of a small fraction (about 3.5 percent) of patients whose care is unusually expensive or who remain hospitalized for unusually long periods.

brought about increased use of care in other settings? Have changing care patterns raised or lowered costs for an overall episode of care? Do Medicare patients now require more extensive or more expensive posthospital care? Do Medicare policies for reimbursing posthospital care need to be changed as a result?

There is no doubt that Medicare patients are being discharged from acute-care hospitals "quicker." The average length of stay for all Medicare patients in short-stay hospitals has declined from 10.5 days in fiscal year 1981 to 8.4 days in fiscal year 1985. Excluding patients whose care was not reimbursed through the PPS, average length of stay in 1985 was only 7.7 days.<sup>2</sup> Whether or not Medicare patients discharged from hospitals or those admitted to posthospital care are in any meaningful sense "sicker" is more problematic. Until now, there has been no systematic evidence that the frequency, the volume, or the intensity of SNF or home health care has increased among Medicare patients discharged from short-stay hospitals since institution of the PPS. Neither has there been any systematic evidence that increased use of SNF and home health services is substituting for the last few days of important hospital care.

The first step toward trying to understand the possible impact of the PPS on the patterns of care provided for Medicare beneficiaries is to document the changes in Medicare use of hospital and posthospital care that have occurred since the introduction of the PPS. In this report, we examine the frequency, the volume, and the costs of SNF and home health care provided to two groups of Medicare beneficiaries—those discharged from short-stay, acute-care hospitals during 1981 (shortly before the introduction of the PPS) and similar patients discharged during the 12 months ending in June 1985 (a period immediately following the introduction of the PPS). Our aim is to identify differences in the use or the costs of SNF and home health care from the pre- to the post-PPS period—differences that might have been caused by the introduction of the PPS.

SNF and home health care are not, of course, the only kinds of posthospital services that are provided to Medicare beneficiaries. Neither are they the only Medicare-covered services that might have been affected by the PPS. Patients dismissed more quickly from acute-care hospitals since the institution of the PPS may, for example, have made heavier use of outpatient physician services. Unfortunately, our data cover only Medicare Part A services, and we cannot observe changes in the use of outpatient physician services.

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<sup>2</sup>Karen Beebe, Wayne Callahan, and Antonio Mariano, "Medicare Short-Stay Hospital Length of Stay, Fiscal Years 1981-1985," *Health Care Financing Review*, Vol. 7, No. 3, Spring 1986, p. 119.

Neither are we able to observe changes in all Part A posthospital care. Earlier work at RAND<sup>3</sup> has shown that care in rehabilitation hospitals and so-called "distinct part" rehabilitation units (both currently exempt from the PPS) should generally be viewed as a form of posthospital care. Some 80 percent of all rehabilitation patients come directly from acute-care hospitals. In the post-PPS period, it is possible to identify rehabilitation care. In the pre-PPS period it is not. (Our present ability to identify these facilities is based on their exemption from the PPS. In 1981, there was no PPS and thus no need for exemption or for clear identification of rehabilitation facilities.) It is impossible, therefore, to make pre- and post-PPS comparisons regarding the use or the costs of rehabilitation care. This report does offer, however, a few observations about the use of rehabilitation care by Medicare beneficiaries in the 1984/85 period.

For the most part, this report is descriptive in nature. Important changes in the U.S. health care system other than the introduction of the PPS were occurring between 1981 and 1984/85, and some of the changes in the patterns and the costs of posthospital care are undoubtedly due to other factors. We have generally restricted ourselves to describing changing patterns of care. Whether or not observed changes in these patterns were in fact caused by the introduction of the PPS is the subject of additional research currently under way. In this report, we seek to provide a basic summary of who uses posthospital care, how much such care they use, how much this care costs, and how all of these have changed in recent years.

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<sup>3</sup>Susan Hosek et al., *Charges and Outcomes for Rehabilitative Care: Implications for the Prospective Payment System*, The RAND Corporation, R-3424-HCFA, November 1986.



## II. THE DATA

The data on which this report is based come principally from hospital billing records for 20 percent random samples of all Medicare beneficiaries discharged from short-stay acute-care hospitals during two 12-month periods: calendar year 1981 and the 12 months ending June 30, 1985. The former period predates the implementation of the PPS, which began in October 1983.<sup>1</sup> The latter is roughly the first year of the fully implemented Medicare PPS. (Some hospitals did not begin to operate under the terms of the PPS until September 1984, but more than 90 percent of the hospitals that eventually would come under the PPS had done so by June 1984.)

We have tried to exclude from our samples patients discharged from hospitals not operating under the PPS. Specifically, we have sought to exclude discharges from facilities exempted from the PPS (rehabilitation hospitals and units, psychiatric hospitals and units, long-stay hospitals, and children's hospitals) and from all-inclusive providers (health maintenance organization hospitals). Our rationale is that since these facilities never came under the terms of the PPS, the experience of their patients is irrelevant to an analysis of changes that might have been caused by the PPS.

For most states in the 1984/85 period, this exclusion is a relatively simple matter. "Non-PPS" bills—bills for care that was reimbursed on some basis other than the PPS—are identified in the Medicare billing files. We have simply excluded all such cases. Four states (New York, New Jersey, Massachusetts, and Maryland), however, had waivers from the PPS during this period.<sup>2</sup> All bills from these states are identified as "non-PPS" bills, and identifying cases for exclusion is more complicated. Fortunately, through other means we can identify most facilities in these states that would have been exempted from the PPS. Inevitably, though, we have failed to identify some of them. We also have no way to identify discharges from all-inclusive providers in the waived states. Thus, our samples for waived and nonwaived states are not completely comparable. For most of our analyses, though, we have restricted our attention to discharges from facilities in nonwaived

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<sup>1</sup>Records of Medicare hospital discharges during 1981 also provided the basis for the original computation of PPS payment rates. This fact is useful for some of the computations reported here and at least partially explains our choice of 1981 for our pre-PPS sample.

<sup>2</sup>Currently, only New Jersey and Maryland still have waivers.

states. Since facilities in the waived states were not subject to the PPS, the experience of their patients is generally irrelevant to inquiries into the impact of the PPS. Thus, our inability to identify all non-PPS cases in the waived states is not a major problem.

To provide a common basis for comparison, we have also tried to exclude "non-PPS" patients from the 1981 sample. Before the PPS, of course, there could be no distinction between "PPS" and "non-PPS" bills, and we have had to adopt different methods for excluding patients discharged from institutions of types that ultimately were exempted from the PPS. In practice, we have included all patients discharged from hospitals that were used in the original calculations of PPS payment rates. (We have a list of these hospitals from the Health Care Financing Administration (HCFA).) This approach fairly effectively excludes specialty hospitals (like rehabilitation hospitals and psychiatric hospitals) and all-inclusive providers, because these hospitals were generally excluded from the original PPS rate calculations. It also excludes, though, some acute-care, short-stay hospitals for which cost reports were considered inadequate at the time these original computations were undertaken. Thus, we have done what we can to make our two samples comparable, but some differences remain.<sup>3</sup>

In both samples, we have excluded patients with recorded covered hospital charges of zero. There is obviously something odd about these records, and we have chosen to leave them out of our analyses. After these exclusions, each sample contains records of some two million episodes of inpatient care. Excluding cases in waived states, each sample includes records for about 1.7 million episodes of hospital care.

The Medicare billing files from which these samples were drawn provide information only about a patient's inpatient hospital stay. Unfortunately, HCFA does not maintain any unified record of all Medicare-covered services supplied to a particular beneficiary. To assemble a record of both hospital and posthospital care provided to a beneficiary, it is necessary to merge records of hospital care with similar records—maintained in separate data files—of SNF and home health care.

Our aim in accomplishing this merger is to create a record of an entire episode of care, including hospital care and all SNF and home health care necessary for the treatment of the complaint that

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<sup>3</sup>Excluding discharges from hospitals not included in the original PPS rate-setting exercise reduces our 1981 sample by about 3.3 percent (66,117 cases). The SNF care use rate was the same (2.4 percent) among these excluded cases as among nonexcluded cases. The home health care use rate was slightly lower among excluded cases than among nonexcluded cases (8.9 percent versus 9.1 percent). It does not appear, then, that exclusion of these cases changed the observed overall patterns of care very much.

necessitated the hospital stay in the first place. For SNF care, this is a relatively straightforward matter. To be eligible for Medicare-reimbursed SNF care, a Medicare beneficiary must have a "qualifying" hospital stay of at least three days, and the subsequent SNF care must be for the same complaint that necessitated the hospitalization. Every episode of Medicare-covered SNF care can, therefore, can be associated with a specific episode of hospital care. Medicare SNF billing records routinely report the dates of the relevant "qualifying" hospital stay, and it is a simple task to attach each episode of SNF care to the proper episode of inpatient hospital care.

The problem is more complicated for home health care. Since mid-1981, no prior hospital stay has been necessary for a Medicare beneficiary to be eligible for home health care. Thus, an episode of home health care is not necessarily clinically associated with a hospital stay that immediately preceded it. Neither do home health billing records carry any diagnostic information that might allow linking care to a particular hospital stay. Further, since mid-1981, there has been no limitation on the amount of home health care that can be covered by Medicare, and on discharge from an acute-care hospital a Medicare beneficiary may resume home health care for a chronic condition completely unrelated to the just completed hospital stay.

In these circumstances, choices about how to link records of home health care to records of hospital and SNF care to form a record of an overall episode of care are necessarily somewhat arbitrary. Recognizing this, we have devised two definitions of an episode of care. We term these our "maximalist" definition and our "extended" definition.<sup>4</sup> The appendix to this report provides detailed specifications of them. It will suffice here to explain that the difference between the two definitions lies in the treatment of home health care. In both definitions, home health care is associated with the most recent hospital stay, as long as home health care begins within 60 days of discharge from an acute-care hospital or an SNF. The maximalist definition includes in an episode only home health care that occurs within 60 days of discharge from an acute-care hospital or from an SNF, whereas the extended definition includes all home health care that occurs within 190 days of hospital discharge. Both definitions associate all SNF care (up to the 100-day Medicare maximum) with the recorded "qualifying" hospital stay, with

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<sup>4</sup>The "maximalist" definition was developed for previous work and was given its name to distinguish it from a more limited "minimalist" definition. (See C. R. Neu et al., *Extending the Medicare Prospective Payment System to Posthospital Care: Planning a Demonstration*, The RAND Corporation, R-3335-HCFA, May 1986.) In the course of this earlier work, we recognized a need for a broader definition of a care episode. The "extended" definition is the result.



only the proviso that this care begin within 30 days of discharge from the acute-care hospital.<sup>5</sup> In both definitions, an episode of care ends and a new episode begins if a patient is readmitted to an acute-care hospital.

There is no way to identify one of these definitions as "more correct" than the other. By using the maximalist definition, we run the risk of missing a significant portion of home health care charges. By using the extended definition, we risk counting home health care for some chronic condition as a part of an acute-care episode. The analyses reported here are for the most part based on the maximalist definition of an episode of care. In a few cases, however, we also report results based on the extended definition. For most purposes, the choice of definition has little effect on the results.

For the 1984/85 sample, we have treated rehabilitation care as another form of posthospital care, linking episodes of care in rehabilitation hospitals and rehabilitation units exempt from the PPS to the most recent prior episode of inpatient acute care (as long as rehabilitation care begins within 60 days of discharge from the acute care hospital). As we noted in the preceding section, a similar linking is not possible for the 1981 sample, and we cannot make pre- and post-PPS comparisons of rehabilitation care use.

The final data base on which our analyses are based, then, contains information on Medicare Part A services (acute-care hospital, SNF, home health, and, in 1984/85, rehabilitation services) provided to patients during episodes of care that begin with a stay in an acute-care hospital. These records include information on length of stay in hospitals and SNFs, number of home health care visits, and covered charges for all these services. In addition, the records note the diagnosis related group (DRG) to which patients were assigned during acute-care hospitalizations, the names of all facilities in which patients received care (which allows us to append institution-specific information drawn from other sources), and some limited demographic information about patients: age, sex, race, and place of residence.

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<sup>5</sup>Current Medicare regulations require that SNF care begin within 30 days of hospital discharge, unless there is some medically foreseeable reason that SNF care will be required at some later time.

### III. OVERALL PATTERNS OF CARE

We begin by considering overall patterns of hospital and posthospital care. Table 3.1 shows highly aggregated statistics on use of hospital and posthospital services and covered charges for these services in the states that did not have waivers from the Medicare PPS in 1984/85.

Table 3.1

#### HOSPITAL AND POSTHOSPITAL CARE IN NONWAIVERED STATES (Maximalist definition of episode of care)

Item	Discharges in	
	1981	1984/85
Hospital Care		
Total Medicare discharges from short-stay hospitals	1,679,405	1,690,644
Average covered charges per discharge	\$3,391	\$4,902
Average length of stay	9.8 days	7.8 days
Average covered charges per day	\$346	\$627
SNF Care		
Number of users	41,739	53,242
Percentage of discharges using SNF care	2.5%	3.1%
Average covered charges per user	\$2,359	\$2,873
Average covered charges per hospital discharge	\$59	\$90
Average covered days per user	29.6 days	25.1 days
Average covered charges per covered day	\$80	\$114
Home Health Care		
Number of users	143,128	225,442
Percentage of discharges using home health care	8.5%	13.3%
Average covered charges per user	\$508	\$756
Average covered charges per hospital discharge	\$43	\$101
Average visits per user	12.8	14.1
Average covered charges per visit	\$40	\$54

It is clear that in the post-PPS period, patients were being discharged from hospitals more quickly. The average hospital length of stay for patients in our samples declined from 9.8 to 7.8 days.<sup>1</sup>

The fraction using SNF care also increased (from 2.5 percent to 3.1 percent). But those who used SNF care had fewer covered days of care on average—25.1 days in the post-PPS period as compared to 29.6 in the pre-PPS period.<sup>2</sup> Although the average number of covered SNF days *per user* of SNF care declined, Medicare hospital patients were in fact making greater use of SNF care in the post-PPS period. The average number of SNF days *per Medicare hospital discharge* has risen from 0.735 days in 1981 to 0.794 days in 1984/85.

Average daily covered charges for SNF care rose 43 percent (10.8 percent per year) from the pre- to the post-PPS samples. By way of comparison, the consumer price index rose 16.3 percent (4.4 percent per year) during the same period. The medical care component of the consumer price index rose 32.6 percent (8.4 percent per year). Per-day SNF charges showed only a modest increase, though, compared to daily hospital charges, which rose 81 percent (18.4 percent per year). The rise in the fraction of patients using SNF care and the increased per-day costs of SNF care more than offset the decline in average length of stay, and the average covered charges for SNF care per acute-care hospital discharge rose from \$59 in 1981 to \$90 in 1984/85.

The picture is a bit different for home health care. There was a dramatic rise in home health care use from the pre- to the post-PPS period. Only 8.5 percent of Medicare hospital discharges in 1981 used home health care within 60 days of hospital discharge. For 1984/85 discharges, this fraction grew to 13.3 percent. The average number of visits for these patients also rose—from 12.8 in 1981 to 14.1 in 1984/85. The cost per visit, however, rose a relatively modest 35 percent (9.0 percent per year), about in line with medical care costs in general.

None of the changes apparent in Table 3.1 can be attributed solely to the institution of the PPS. This is particularly true with regard to home health care. Both the number of Medicare beneficiaries using home health care and the number of home health visits per user

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<sup>1</sup>These lengths of stay for Medicare patients in nonwaivered states differ slightly from those for *all* Medicare hospital patients reported in Sec. I. Average hospital lengths of stay were longer for Medicare patients in waived states and were somewhat longer in both periods (see Table 3.3) than for patients in nonwaivered states.

<sup>2</sup>This does not necessarily mean that total lengths of stay in SNFs were shorter, only that Medicare paid for fewer days of SNF care. We do not have reliable data on SNF care not covered by Medicare. In the remainder of this report, we will sometimes use the phrase "SNF length of stay" rather than the more cumbersome "number of covered days of SNF care." The former should be understood as referring only to SNF care reimbursed by Medicare.

showed pronounced upward trends before the PPS was instituted in 1983. (See Table 3.2.<sup>3</sup>) In particular, the Omnibus Budget Reconciliation Act of 1980 (OBRA) provided an impetus to increase use by liberalizing Medicare regulations concerning home health care.<sup>4</sup>

For the sake of completeness, Table 3.3 provides figures similar to those shown in Table 3.1, but for the four states—Maryland, Massachusetts, New Jersey, and New York—that had waivers from the Medicare PPS in 1984/85. A comparison of Tables 3.1 and 3.3 reveals some differences. In particular, notice that in the waived states, SNF use declined from 1981 to 1984/85 and SNF lengths of stay and number of home health visits per user was essentially unchanged. One should not attach too much significance to the experiences of waived states; approaches to Medicare reimbursement vary among these states and were not constant between 1981 and 1984/85. It is worth remembering, though, that both levels of use and changes in use were different in waived and nonwaived states.

Table 3.2

## MEDICARE HOME HEALTH CARE SERVICES

Year	Persons Served	Home Health Visits per Person Served
	per 1000 Medicare Enrollees	
1974	16	21
1976	23	23
1978	28	23
1980	34	23
1982	40	26
1983	45	27
1984	50	27
1985	51	25

SOURCE: Will Kirby, Vikki Latta, and Charles Helbing, "Medicare Use and Cost of Home Health Agency Services, 1983-1984," *Health Care Financing Review*, Vol. 8, No. 1, Fall 1986, pp. 93-100.

<sup>3</sup>Note that the figures in Table 3.2 are for *all* Medicare-reimbursed home health care, not just for care that follows an episode of acute inpatient hospital care.

<sup>4</sup>Specifically, OBRA (1) removed limits on the number of home health visits permitted; (2) eliminated the requirement for a three-day prior hospital stay; (3) eliminated the deductible for home health care services covered under supplementary medical insurance (Medicare Part B); and (4) permitted the establishment of proprietary HHAs in states not having licensure laws. The changes became effective in mid-1981.



Table 3.3

HOSPITAL AND POSTHOSPITAL CARE IN WAIVERED STATES  
(Maximalist definition of episode of care)

Item	Discharges in	
	1981	1984/85
Hospital Care		
Total Medicare discharges from short-stay hospitals	257,749	298,496
Average covered charges per discharge	\$4,131	\$5,475
Average length of stay	13.2 days	12.2 days
Average covered charges per day	\$313	\$449
SNF Care		
Number of users	5,330	5,363
Percentage of discharges using SNF care	2.1%	1.8%
Average covered charges per user	\$3,049	\$3,379
Average covered charges per hospital discharge	\$63	\$61
Average covered days per user	31.9 days	31.4 days
Average covered charges per covered day	\$96	\$108
Home Health Care		
Number of users	34,072	47,137
Percentage of discharges using home health care	13.2%	15.8%
Average covered charges per user	\$534	\$745
Average covered charges per hospital discharge	\$71	\$118
Average visits per user	15.0	15.1
Average covered charges per visit	\$36	\$49

An interesting pattern appears if we compare average hospital lengths of stay for patients who used posthospital care with average hospital lengths of stay for all Medicare patients. (See Table 3.4.) Users of posthospital care had markedly longer average lengths of stay than did the general population. This is not surprising; one might expect that more seriously ill patients would have longer hospital stays and would also be more likely to require posthospital care. What is striking, though, is that hospital lengths of stay declined more for users of posthospital care than for the general population of Medicare hospital patients. This *might* reflect some substitution of posthospital care

Table 3.4  
HOSPITAL LENGTHS OF STAY  
(In days)

Year	All Medicare Discharges	SNF Users	Home Health Care Users
Excluding Waivered States			
1981	9.8	21.2	15.8
1984/85	7.8	14.1	11.3
(% change)	(-20)	(-30)	(-29)
All States			
1981	10.3	22.3	16.6
1984/85	8.5	16.1	12.4
(% change)	(-17)	(-28)	(-26)

NOTE: There is some overlap between SNF users and home health care users. Patients who received both kinds of care are included in both averages.

for the last few days of inpatient hospital care. After the introduction of the PPS, hospitals would presumably have tried to shorten lengths of stay for all patients. It is conceivable that these efforts would have been most successful for the group of patients for whom SNF or home health care was an appropriate and feasible alternative to hospital care; there was, after all, somewhere to send these patients. If this were the case, then we might expect to see a larger decline in hospital lengths of stay for patients who actually used posthospital care.

## DISTRIBUTIONS OF COVERED SNF DAYS AND HOME HEALTH VISITS

Consideration of the distribution of covered days of SNF care lends some support to the hypothesis that hospitals may be substituting posthospital care (or at least SNF care) for the last few days of inpatient care. We have already seen that the fraction of Medicare hospital patients who subsequently use SNF care rose from the pre- to the post-PPS periods. It appears that these "new" SNF users were concentrated at the short end of the distribution of SNF length of stay. (One consequence of this was the reduction in the average number of



covered SNF days per SNF user that was reported in the preceding section.)

Figure 3.1 shows the distribution of SNF covered days for Medicare patients in the nonwaivered states in both the pre- and the post-PPS periods. Notice that there are markedly more patients with relatively short stays in the post-PPS sample than in the pre-PPS sample. In contrast, the number of patients with longer stays (40 through 99 days) is almost identical in the two samples. Finally, even though the total number of SNF users increased by nearly 28 percent between 1981 and 1984/85, the number of users who used the Medicare maximum 100 days of SNF care *declined* by more than 25 percent.

The shift to shorter SNF stays is also apparent in Table 3.5, which provides the same information as Fig. 3.1 but in tabular form. In the 1984/85 sample, 20.7 percent of all SNF users had seven or fewer covered days of care, and 57.5 percent had 20 or fewer covered days. The comparable figures for the 1981 sample were 16.5 percent and 49.8

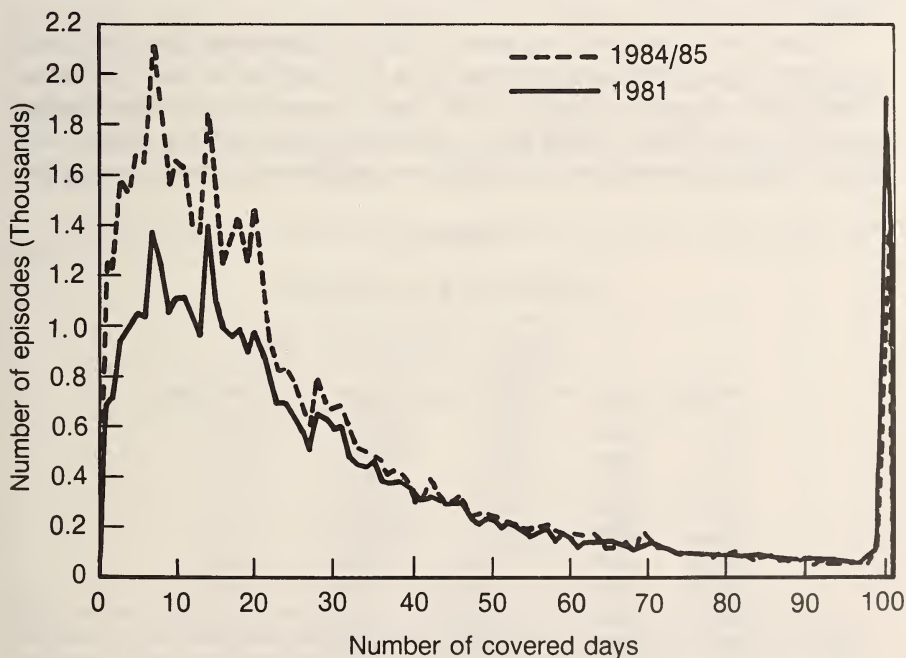


Fig. 3.1—SNF covered days per episode in nonwaivered states

percent. The decline in absolute numbers of patients staying more than 80 days is particularly striking in this table. We know of no particular change in Medicare policy regarding SNF care (more stringent application of eligibility criteria, for example) between 1981 and 1984/85 that might have brought about this result.

This shift in the distribution of SNF covered days is consistent with what we might expect to observe if hospitals were substituting SNF care for the last few days of inpatient care. Consider a patient who in the pre-PPS environment might have been expected to need 60 days of SNF care following discharge from the hospital. This patient would probably have used SNF care whether there were a PPS or not, and efforts by the hospital to shave a few days off his hospital stay might not change the length of his SNF stay very much. On the other hand, consider a "marginal" patient, one who in the pre-PPS environment would have stayed in the hospital until he was ready to go home. In the post-PPS environment, the hospital might discharge him a few days before he is able to go home, sending him to an SNF for a short stay. The result would be an increase in the number of SNF patients with relatively short stays and a reduction in the average SNF length of stay.

A possible alternative explanation for the increased prevalence of relatively short SNF stays in the post-PPS period is that, in areas where SNF capacity is limited, SNF care is reserved for patients who need it most. These might also be patients who need the most SNF care. With increased use of SNF care, additional patients requiring

Table 3.5

## COVERED DAYS OF SNF CARE

Number	1981		1984	
	Cases	% of SNF Cases	Cases	% of SNF Cases
1-7	6,863	16.5	11,063	20.7
8-14	7,950	19.1	11,352	21.3
15-20	5,913	14.2	8,267	15.5
21-30	6,653	15.9	8,016	15.0
31-44	5,728	13.7	6,343	11.9
45-60	2,989	7.2	3,229	6.1
61-80	2,327	5.6	2,370	4.4
81-99	1,360	3.3	1,275	2.4
100	1,934	4.6	1,440	2.7

less SNF care may now be admitted to SNFs, and the average length of SNF stays will fall.

Although this is perhaps a plausible explanation, we know of no direct evidence to support it. As far as we know, there is no evidence that SNF care is, in fact, typically reserved for patients who need the most of it. Thus, although our data are consistent with the hypothesis that SNF care may be substituting for the last few days of hospital care, they do not establish this. What does seem clear, however, is that Medicare-reimbursed SNF care has taken on a shorter-term, less "chronic" character since the institution of the PPS.

One slightly quirky characteristic of these data that has not changed from the pre- to the post-PPS periods is the tendency for Medicare beneficiaries to consume SNF care in week-long increments. Both distributions in Fig. 3.1 show heavy concentrations of seven-day, 14-day, and 28-day stays. The peak that might have been expected at 21 days comes instead at 20 days. Under current regulations, the first 20 days of SNF care are fully reimbursed by Medicare. After 20 days of care, however, patients are responsible for substantial copayments. Many SNF patients apparently decide to use only the 20 days of completely free care. Notice the sharp decline after 20 days in both of the distributions shown in the figure.<sup>5</sup>

In contrast to the situation with SNF care, there has been no shift toward less home health care per user. Indeed, as we saw in Table 3.1, the average number of home health visits per user actually rose from the pre- to the post-PPS period. If home health care is substituting for

<sup>5</sup>The SNF copayment (required after the twentieth day) has been steadily rising since 1981:

Calendar Year	Amount
1981	\$25.50
1982	32.50
1983	38.00
1984	44.50
1985	50.00
1986	61.50
1987	71.50

The required copayment amount for 1984/85 (approximated by the average of the amounts for 1984 and 1985) was 85 percent higher than the copayment amount for 1981. Our data suggest that over this same period, average covered charges per day of SNF care rose only 42 percent. Thus, in 1984/85 Medicare beneficiaries were paying a larger share of SNF covered charges after the twentieth day of care than they were in 1981. These higher required copayments may have contributed to the reduction in SNF lengths of stay.

the last few days of hospital care for some Medicare patients, these "new" home health care patients are not using less home health care than was typical for home health care patients in the pre-PPS environment. Figure 3.2 shows the distribution of number of covered home health visits for Medicare patients in the nonwaivered states in both sample periods. This figure is based on our maximalist definition of an episode of care. The number of cases at every number of covered visits increased from 1981 to 1984/85, and the overall distributions look roughly similar in the two periods.

The only noteworthy change from the earlier to the later period seems to be the increase in the modal number of visits, from one in 1981 to three in 1984/85. We have no real explanation for this change, and we are somewhat puzzled by the large number of patients in the earlier period who had only one covered visit. Because a mode of one covered visit has not persisted into the later period, we have not pursued a more detailed examination of what kind of patient has only one home health care visit.

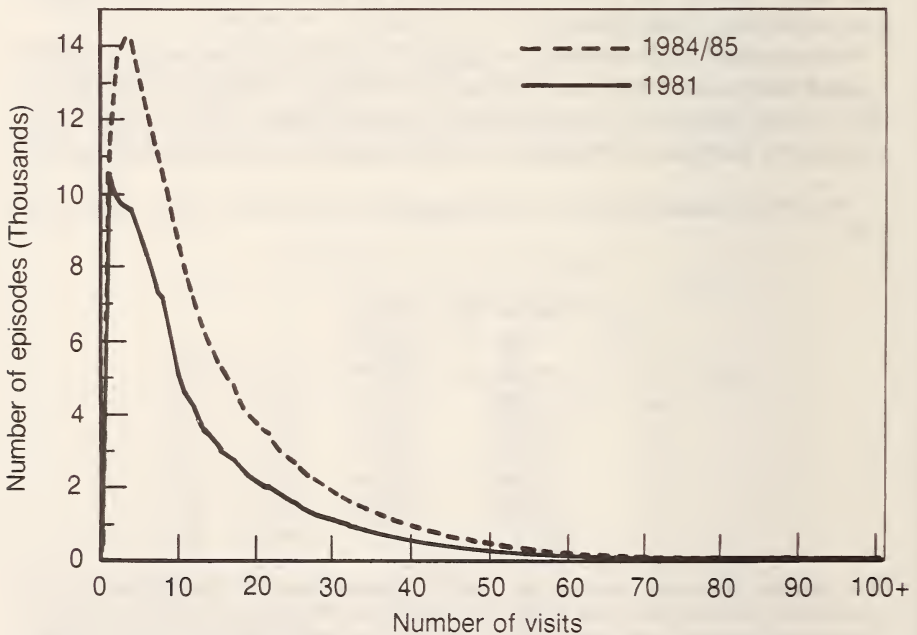


Fig. 3.2—Home health visits per maximalist episode in nonwaivered states



Figure 3.3 is similar to Fig. 3.2, but is based on our extended definition of an episode of care. As might be expected, we see more cases with large numbers of visits, but the general shape of the distribution and the changes from 1981 to 1984/85 are similar to what we saw for the maximalist definition.

### AGE OF POSTHOSPITAL PATIENTS

The average age of posthospital care users—both SNF and home health—increased from 1981 to 1984/85. This change is more than explained, however, by the fact that the average age of all Medicare hospital discharges increased over the same period. Indeed, it was among relatively young Medicare beneficiaries that the likelihood of using posthospital care showed the largest increases.

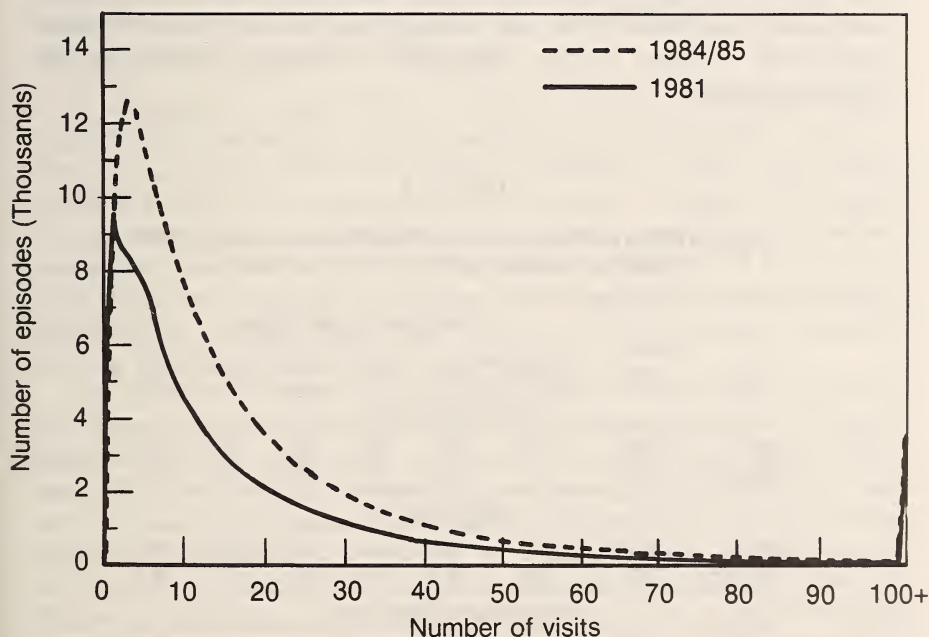


Fig. 3.3—Home health visits per extended episode in nonwaivered states



Table 3.6 shows the average ages of Medicare discharges, SNF users, and home health care users in the pre- and the post-PPS periods. It also shows the distribution of these patients across six age groups. For all three categories of patients, the younger age groups account for a smaller fraction of the total and the older age groups for a larger fraction in the post-PPS period than in the pre-PPS period. These shifts are much more pronounced, however, for all hospital discharges than they are for either category of posthospital care users.

Table 3.7 shows the propensity of Medicare patients to use posthospital care during our two sample periods—both overall and by age groups. All age groups showed statistically significant increases in propensity to use posthospital care in both SNF and home health care settings. These increases were greater for the younger age groups than for the older age groups. This pattern is consistent with hospitals' transferring larger numbers of "marginal" patients—patients who before the PPS might not have received posthospital care—to SNF or home health care as a substitute for the last few days of hospital care. One might reasonably expect that these "marginal" patients are disproportionately represented in the younger age groups—thus, the more pronounced increase in the propensity of younger patients to use posthospital care.

Table 3.6

MEDICARE HOSPITAL AND POSTHOSPITAL PATIENTS IN  
NONWAIVERED STATES, BY AGE GROUP

Year	Average Age	Percentage in Age Group					
		Under 65	65-69	70-74	75-79	80-84	85+
Hospital Discharges							
1981	72.8	11.8	22.5	21.6	18.6	13.7	11.8
1984/85	73.5	10.7	20.6	21.7	19.2	14.5	13.2
SNF Users							
1981	79.4	3.1	8.9	14.5	20.4	23.6	29.5
1984/85	79.7	3.0	8.2	14.6	20.6	22.9	30.7
Home Health Care Users							
1981	75.9	7.1	15.4	19.9	21.6	18.7	17.2
1984/85	76.1	6.8	14.3	20.2	22.2	19.1	17.4

Table 3.7

**PATIENTS DISCHARGED BY HOSPITALS AND USING POSTHOSPITAL  
CARE IN NONWAIVERED STATES, BY AGE GROUP**

Year	Overall	Percentage in Age Group					
		Under 65	65-69	70-74	75-79	80-84	85+
SNF Users							
1981	2.5	0.6	1.0	1.7	2.7	4.3	6.2
1984/85	3.1	0.9	1.3	2.1	3.4	5.0	7.3
Ratio (1984/85:1981)	(1.24)	(1.35)	(1.29)	(1.27)	(1.24)	(1.16)	(1.17)
Home Health Care Users							
1981	8.5	5.1	5.8	7.8	9.9	11.7	12.8
1984/85	13.3	8.4	9.3	12.4	15.4	17.6	17.5
Ratio (1984/85:1981)	(1.55)	(1.65)	(1.59)	(1.58)	(1.55)	(1.51)	(1.41)

NOTE: All differences significant at 95 percent level.

## **HOSPITAL READMISSION RATES AND MORTALITY RATES AMONG SNF PATIENTS**

If introduction of the PPS has in fact resulted in Medicare beneficiaries' being discharged "quicker and sicker" to posthospital care settings, it is possible that this would be reflected in more posthospital patients having to be readmitted to the hospital. A patient discharged "prematurely" from the hospital is presumably more likely to require subsequent readmission. For SNF patients in particular, it is also possible that part of the observed decline in average SNF lengths of stay is explained by the fact that a larger share of SNF stays are truncated because patients are readmitted to hospitals.

Our data do not allow us to identify clearly the beginning and ending dates of home health care, and it is therefore difficult to identify patients who are readmitted to hospitals directly from home health care. For SNF patients, though, we have specific discharge dates, and we can identify SNF patients who are transferred back to an acute-care hospital. (Operationally, we count as transferred any patient who is admitted to an acute-care hospital on the same day as or on the day following discharge from an SNF.) Contrary to what might have been expected, hospital readmission rates among Medicare SNF patients did not rise after the introduction of the PPS. Indeed, these rates declined slightly—from 21.5 percent in 1981 to 20.0 percent in 1984/85. This overall pattern does not hold for all DRGs. (See Sec. IV.)

A somewhat cruder measure of whether SNF patients are “sicker” in the post-PPS environment is provided by mortality rates for patients in SNFs. Perhaps surprisingly again, mortality rates among Medicare SNF patients declined markedly—from 22.1 percent in 1981 to 15.8 percent in 1984/85. This pattern also is repeated for individual DRGs. (See Sec. IV.)

## COMBINATIONS OF POSTHOSPITAL CARE

Table 3.8 shows the fractions of Medicare hospital discharges using various combinations of hospital and posthospital care in both sample periods. The fraction of patients using both SNF and home health care has risen (from 0.37 percent to 0.58 percent) but still represents only a small minority of patients. Almost all of this increase is accounted for by an increase in the number of SNF patients who subsequently received home health care. (In 1981, 13.9 percent of SNF patients subsequently used home health care. By 1984/85, this fraction had grown to 17.4 percent.) This fact, coupled with the observation that average SNF stays have become shorter, might lead one to wonder whether concern over discharge policies can be confined to inpatient hospital care. Perhaps SNFs are also discharging Medicare beneficiaries “quicker and sicker,” even though per-case prospective payment has not been applied to SNF care.

Table 3.8

### PERCENTAGE OF MEDICARE DISCHARGES USING VARIOUS COMBINATIONS OF POSTHOSPITAL CARE

Type of Care	1981	1984/85
No posthospital care	89.36	84.09
Home health care only	8.16	12.76
SNF care only	2.12	2.57
SNF, then home health care	0.34	0.54
Home health, then SNF care	0.03	0.04
Total	100.00	100.00

## TIME BETWEEN HOSPITAL AND POSTHOSPITAL CARE

Table 3.9 indicates how soon home health care begins after discharge from an acute-care hospital. HCFA billing records contain less than completely reliable indications of when home health care commenced. Home health agencies typically submit bills to Medicare fiscal intermediaries on some regular basis—fortnightly or monthly, for example—and it appears that in some cases the date recorded for the beginning of care is merely the first day in the regular reporting period during which care was first provided. (The clearest indication of this problem is found in the top line of Table 3.9. For about 4 percent of the cases in each sample, Medicare billing records suggest that home health care commenced *before* discharge from the acute-care hospital.)

The figures in Table 3.9 suggest that delays of two to 14 days were a bit more common in the pre-PPS period, whereas very short delays and delays of more than two weeks became more common in the post-PPS period. Given the unreliability of the timing data on which Table 3.9

Table 3.9

### INTERVAL BETWEEN HOSPITAL DISCHARGE AND BEGINNING OF HOME HEALTH CARE

No. of Days	Percentage of All Users of Home Health Care	
	1981	1984/85
< 0	4.0	4.7
0	5.3	7.4
1	29.6	31.6
2	12.7	11.3
3	10.9	9.0
4	6.8	4.9
5	4.6	3.2
6	3.4	2.3
7	2.4	2.0
8-14	9.0	8.9
15-20	4.6	5.8
21-30	3.0	4.0
31-60	3.7	4.9
Total	100.0	100.0

NOTE: Cases in which either SNF care or rehabilitation care was used between hospital discharge and the beginning of home health care have been excluded in compiling this table.



is based, though, one should probably not read anything significant into these changes.

There do not seem to have been any important changes in times between hospital discharge and the beginning of SNF care. In both periods, the vast majority (96.9 percent in 1981 and 96.4 percent in 1984/85) of patients who used SNF care began this care on the same day that they were discharged from an acute-care hospital.

### EFFECT OF CHANGING THE DEFINITION OF AN EPISODE OF CARE

Table 3.10 repeats the home health section of Table 3.1, adding columns to show results for the extended definition of an episode of care. It is obvious that changing from the maximalist to the extended definition makes a major difference in number of visits and total covered home health charges. The choice of definition does not, however, have an important effect on the average cost of a visit. (Average

Table 3.10

#### EFFECTS OF DIFFERENT EPISODE DEFINITIONS IN NONWAIVERED STATES FOR THOSE USING HOME HEALTH CARE

Item	1981		1984/85	
	Maximalist	Extended	Maximalist	Extended
Number of users	143,128	143,128	225,442	225,457
Percentage of discharges using home health care	8.5	8.5	13.3	13.3
Average covered charges per user	\$508	\$742	\$756	\$1074
Average covered charges per hospital discharge	\$43	\$63	\$101	\$143
Average visits per user	12.8	18.9	14.1	20.2
Average covered charges per visit	\$40	\$39	\$54	\$53



cost per visit is slightly lower using the extended definition, suggesting that later visits tend to be cheaper than earlier ones.) More important, the patterns of change from 1981 to 1984/85 seem to be roughly the same whichever definition we choose, even if the levels of some of the variables are different.

## REHABILITATION CARE

We noted above that care in rehabilitation hospitals and rehabilitation units might best be thought of as a form of posthospital care. Table 3.11 provides aggregate statistics similar to those for SNF and home health care in Tables 3.1 and 3.3 for postacute rehabilitation care in the 1984/85 period. (Comparable figures for 1981 are not available.) Although a much smaller fraction of hospital discharges use rehabilitation than use SNF or home health care, the very high costs of rehabilitation care bring the average covered charge per discharge for rehabilitation care to roughly two-thirds of the average covered charge per discharge for SNF and home health care.

Table 3.11

### REHABILITATION CARE IN REHABILITATION HOSPITALS AND EXEMPT REHABILITATION UNITS, 1984/85

Item	Nonwaivered States	Waivered States
Number of users	9,303	255
Percentage of discharges using rehabilitation care	0.6	0.1
Average covered charges per user	\$10,489	\$10,549
Average covered charges per hospital discharge	\$58	\$9
Average covered days per user	23.2 days	27.0 days
Average covered charges per day	\$452	\$391

## IV. POSTHOSPITAL USE AND CHARGES BY DRG

In this section, we provide details on how patterns of posthospital care and charges for this care vary for patients in different DRGs and how these patterns and charges have changed over time.

### IMPORTANT DRGS

Tables 4.1 and 4.2 show the DRGs (to which patients are assigned during their inpatient hospital care) that account for most Medicare outlays for SNF and home health care. In these tables, DRGs are ranked by the fraction of all Medicare outlays for SNF and home health services, respectively, accounted for by that DRG. DRG 14, for example, accounted for 16.61 percent of all Medicare outlays for SNF care in 1984/85. The figures for SNF care (Table 4.1) have been adjusted to account for (estimated) patient copayments beyond the twentieth day of SNF care. The figures for home health care (Table 4.2) reflect the maximalist definition of an episode of care. Table 4.3 lists the DRGs that accounted for the largest fractions of all Medicare covered charges for posthospital rehabilitation care in the 1984/85 period.<sup>1</sup> Figures for rehabilitation charges in 1981 are not available.

The first thing to notice about Tables 4.1, 4.2, and 4.3 is that a relatively few DRGs account for the bulk of Medicare outlays for posthospital care in all settings. The 23 DRGs that are most important for SNF care account for 68 percent of all Medicare SNF outlays but only about 34 percent of all Medicare-covered acute hospital episodes. This concentration is somewhat less pronounced, but still apparent, for home health care. The 23 most important DRGs for home health care account for 52 percent of Medicare outlays for posthospital home health care but only 43 percent of Medicare hospital episodes. Rehabilitation care, on the other hand is extremely heavily concentrated among a very few DRGs. The 12 DRGs shown in Table 4.3 accounted for 69 percent of all posthospital rehabilitation charges covered by Medicare in 1984/85. (Indeed, just one DRG—DRG 14, stroke—

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<sup>1</sup>The figures in Table 4.3 have not been adjusted to reflect required deductibles and patient copayments for rehabilitation care. In this regard, they differ slightly from the figures for SNF care shown in Table 4.1, which have been adjusted for copayments and therefore reflect an estimate of Medicare outlays as opposed to total covered charges. No adjustments are required for the home health care figures shown in Tables 4.2 and 4.3 because no deductibles or copayments are required for home health care.

Table 4.1

IMPORTANT DRGS FOR SNF CARE: PERCENTAGE OF TOTAL COVERED  
CHARGES, ADJUSTED FOR PATIENT COPAYMENT,  
NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	16.6	15.2
210	Hip and femur procedures except major joint <sup>a</sup>	13.5	7.8
209	Major joint and limb reattachment procedures	8.4	4.5
89	Simple pneumonia and pleurisy <sup>a</sup>	2.8	1.8
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	2.5	1.6
127	Heart failure and shock	2.5	2.2
468	Unrelated operating room procedures	2.2	3.4
236	Fractures of hip and pelvis	1.9	3.3
79	Respiratory infections and inflammations <sup>a</sup>	1.6	0.3
320	Kidney and urinary tract infections <sup>a</sup>	1.6	1.1
263	Skin grafts for skin ulcer or cellulitis, age $\geq 70$	1.6	0.3
148	Major large and small bowel procedures <sup>a</sup>	1.3	0.7
113	Amputation for circulatory disorders except upper limb and toe	1.2	1.3
416	Septicemia, age $\geq 18$	1.2	0.3
243	Medical back problems	1.1	1.2
239	Pathological fractures and musculoskeletal and connective tissue malignancy	1.1	0.3
271	Skin ulcers	1.0	1.1
1	Craniotomy, age $\geq 18$ , except for trauma	1.0	0.6
87	Pulmonary edema and respiratory failure	1.0	0.3
82	Respiratory neoplasms	0.9	1.0
253	Fractures, sprains, strains, and dislocation of upper arm, lower leg except foot <sup>a</sup>	0.9	1.2
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	0.9	0.9
174	Gastrointestinal hemorrhage <sup>a</sup>	0.8	0.5
Total (23 DRGs)		67.6	50.9
Other DRGs That Were Important in 1981			
88	Chronic obstructive pulmonary disease	0.8	1.3
12	Degenerative nervous system disorders	0.7	1.7
130	Peripheral vascular disorders <sup>a</sup>	0.7	1.2
294	Diabetes, age $\geq 36$	0.7	1.5
132	Atherosclerosis <sup>a</sup>	0.2	2.0
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	0.2	5.3
467	Other factors influencing health status	0.0	0.9
470	Ungroupable	0.0	3.3
Total (All DRGs)		100.0	100.0

<sup>a</sup>Age  $\geq 70$  and/or complications.

Table 4.2

IMPORTANT DRGS FOR HOME HEALTH CARE: PERCENTAGE OF TOTAL  
COVERED CHARGES, MAXIMALIST DEFINITION,  
NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	6.7	6.7
127	Heart failure and shock	5.8	4.4
209	Major joint and limb reattachment procedures	4.5	2.4
210	Hip and femur procedures except major joint <sup>a</sup>	3.6	1.9
89	Simple pneumonia and pleurisy <sup>a</sup>	2.9	1.8
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	2.8	1.5
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	2.1	2.0
320	Kidney and urinary tract infections <sup>a</sup>	2.0	1.6
148	Major large and small bowel procedures <sup>a</sup>	2.0	1.2
468	Unrelated operating room procedures	1.9	3.2
88	Chronic obstructive pulmonary disease	1.9	2.7
294	Diabetes, age $\geq 36$	1.8	3.0
140	Angina pectoris	1.7	0.8
243	Medical back problems	1.7	1.5
15	Transient ischemic attack and precerebral occlusions	1.4	1.1
138	Cardiac arrhythmia and conduction disorders <sup>a</sup>	1.4	1.0
96	Bronchitis and asthma <sup>a</sup>	1.4	1.0
87	Pulmonary edema and respiratory failure	1.3	0.5
121	Circulatory disorders with acute myocardial infarction and cardiovascular complications; discharged alive	1.3	N/A
174	Gastrointestinal hemorrhage <sup>a</sup>	1.1	0.7
239	Pathological fractures and musculoskeletal and connective tissue malignancy	1.1	0.4
82	Respiratory neoplasms	1.0	1.3
130	Peripheral vascular disorders <sup>a</sup>	1.0	1.4
Total (23 DRGs)		52.4	42.1
Other DRGs That Were Important in 1981			
122	Circulatory disorders with acute myocardial infarction without cardiovascular complications; discharged alive	0.9	1.5
236	Fractures of hip and pelvis	0.9	1.2
12	Degenerative nervous system disorders	0.7	1.3
132	Atherosclerosis <sup>a</sup>	0.4	3.2
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	0.1	1.8
467	Other factors influencing health status	0.1	1.2
470	Ungroupable	0.0	3.8
Total (All DRGs)		100.0	100.0

<sup>a</sup>Age  $\geq 70$  and/or complications.



Table 4.3

IMPORTANT DRGS FOR REHABILITATION CARE: PERCENTAGE OF ALL  
COVERED POST-ACUTE CHARGES, NONWAIVERED STATES

DRG	Description	1984/85
14	Specific cerebrovascular disorders except transient ischemic attack	43.6
210	Hip and femur procedures except major joint <sup>a</sup>	5.1
209	Major hip procedures	4.4
1	Craniotomy, age $\geq 18$ except for trauma	3.4
468	Unrelated operating room procedure	2.6
214	Back and neck procedures <sup>a</sup>	1.8
5	Extracranial vascular procedures	1.7
113	Amputation for circulatory system disorders except upper limb and toe	1.7
12	Degenerative nervous system disorders	1.4
15	Transient ischemic attack	1.2
285	Amputations for endocrine, nutritional, and metabolic disorders	1.2
110	Major reconstructive vascular procedures <sup>a</sup>	1.1
Total (12 DRGs)		69.2

<sup>a</sup>Age  $\geq 70$  and/or complications.

accounted for 44 percent of all covered charges.) These 12 DRGs, however, account for only 11 percent of all acute Medicare hospital episodes.

Perhaps more striking is the degree to which the same DRGs are important for both SNF and home health care. DRG 14 (stroke) accounts for the largest share by far of outlays for both SNF and home health care. The first six DRGs are the same (although the order is somewhat different) for both SNF and home health care. Fourteen DRGs are common to both Tables 4.1 and 4.2. A number of these same DRGs also account for large portions of Medicare-covered rehabilitation charges. In particular, the top three DRGs for rehabilitation care—DRG 14 (stroke), DRG 209 (major hip procedures), and DRG 210 (hip and femur procedures except major joint)—are at or near the top of both the SNF and home health care lists.

Table 4.4 shows the important home health DRGs when we use the extended definition of an episode of care. This change in definition changes very little. DRG 416 (septicemia) edges into the top 23 DRGs and DRG 82 (respiratory neoplasms) is edged off. There are a few minor changes in the order of the other DRGs, but in general, it does not seem to matter for these purposes which definition of an episode of care we choose.



Table 4.4

IMPORTANT DRGS FOR HOME HEALTH CARE: PERCENTAGE OF  
TOTAL COVERED CHARGES, EXTENDED DEFINITION,  
NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	7.3	7.1
127	Heart failure and shock	5.8	4.4
209	Major joint and limb reattachment procedures	3.9	2.1
210	Hip and femur procedures except major joint <sup>a</sup>	3.3	1.8
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	2.9	1.5
89	Simple pneumonia and pleurisy <sup>a</sup>	2.9	1.9
320	Kidney and urinary tract infections <sup>a</sup>	2.5	2.0
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	2.2	2.2
468	Unrelated operating room procedures	1.9	3.0
88	Chronic obstructive pulmonary disease	1.9	2.7
294	Diabetes, age $\geq 36$	1.9	3.1
140	Angina pectoris	1.8	0.8
148	Major large and small bowel procedures <sup>a</sup>	1.7	1.0
243	Medical back problems	1.6	1.4
15	Transient ischemic attack and precerebral occlusions	1.5	1.1
138	Cardiac arrhythmia and conduction disorders <sup>a</sup>	1.4	1.0
96	Bronchitis and asthma <sup>a</sup>	1.4	1.0
87	Pulmonary edema and respiratory failure	1.3	0.4
174	Gastrointestinal hemorrhage <sup>a</sup>	1.2	0.7
121	Circulatory disorders with acute myocardial infarction and cardiovascular complications; discharged alive	1.1	N/A
239	Pathological fractures and musculoskeletal and connective tissue malignancy	1.1	0.4
130	Peripheral vascular disorders <sup>a</sup>	1.1	1.5
416	Septicemia, age $\geq 18$	1.0	0.4
Other DRGs That Were Important in 1981			
12	Degenerative nervous system disorders	0.7	1.5
82	Respiratory neoplasms	0.9	1.2
122	Circulatory disorders with acute myocardial infarction without cardiovascular complications; discharged alive	0.8	1.4
132	Atherosclerosis <sup>a</sup>	0.4	3.3
134	Hypertension	0.4	1.2
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	0.1	1.6
236	Fractures of hip and pelvis	0.8	1.2
467	Other factors influencing health status	0.1	1.2
470	Ungroupable	0.0	4.3
Total (All DRGs)		100.0	100.0

<sup>a</sup>Age  $\geq 70$  and/or complications.

Perhaps not surprisingly, a somewhat different set of DRGs was more important in 1984/85 period than in 1981. The tables show the top 23 DRGs for SNF care and for home health care in 1984/85. Table 4.1 also shows an additional eight DRGs that were among the top 23 DRGs for SNF care in 1981 but no longer among the top 23 in 1984/85. Table 4.2 includes seven such DRGs for home health care.

Among the more significant changes from the pre- to the post-PPS periods are the increased importance in terms of outlays for SNF care of DRGs 210 (hip and femur procedures except major joint procedures), 209 (major joint procedures), 79 (respiratory infections and inflammations), and 263 (skin grafts) and the decreased importance of DRGs 233 (other musculoskeletal and connective tissue procedures), 467 (other factors influencing health status), and 470 (ungroupable). For home health care, the major changes were increases in the importance of DRGs 209, 210, 121 (circulatory disorders with acute myocardial infarction), and 239 (pathological fractures and musculoskeletal malignancies) and the decreased importance of DRGs 233, 467, 470, and 132 (arteriosclerosis).

Differences in important DRGs in the two periods do not seem to be due primarily to changes in the use of the posthospital care sector by patients in particular DRGs. Instead, the changing importance of particular DRGs for posthospital care simply reflects that some DRGs have become more or less frequent among Medicare hospital patients. Tables 4.5 and 4.6, listing the same DRGs shown in Tables 4.1 and 4.2, show the fraction of all Medicare discharges from short-stay, acute-care hospitals that were accounted for by each DRG in both the pre- and post-PPS periods. The increasing importance of DRGs 209, 210, 79, and 263 in accounting for SNF outlays largely reflects that all of these DRGs were simply more common in 1984/85 than they were in 1981. Similarly, the decreased importance of DRGs 233, 467, and 470 seems due mostly to decreased incidence of these DRGs overall. The same patterns are observable among the DRGs most important for home health care.

Changes in the frequency of particular DRGs in the overall Medicare hospital population do not necessarily indicate an underlying change in the true Medicare case mix. Changes in the frequency of some DRGs are simply reflections of better coding of DRGs. The decline in DRG 470 (a catch-all DRG for cases that cannot be assigned to other DRGs), for example, from 1981 to 1984/85 reflects nothing other than improvements in the algorithm for assigning patients to DRGs. DRG 121 appears on the list of important DRGs for home health care and DRG 122 drops off the list because of a change in DRG coding. In 1981, both of these DRGs were lumped together and

Table 4.5

PERCENTAGE OF ALL MEDICARE HOSPITAL DISCHARGES  
ACCOUNTED FOR BY DRGS IMPORTANT FOR SNF CARE,  
NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	3.1	2.5
210	Hip and femur procedures except major joint <sup>a</sup>	1.2	0.6
209	Major joint and limb reattachment procedures	1.6	0.8
89	Simple pneumonia and pleurisy <sup>a</sup>	3.5	2.3
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	2.0	1.0
127	Heart failure and shock	5.0	3.6
468	Unrelated operating room procedures	1.4	2.2
236	Fractures of hip and pelvis	0.4	0.5
79	Respiratory infections and inflammations <sup>a</sup>	0.7	0.1
320	Kidney and urinary tract infections <sup>a</sup>	1.4	1.1
263	Skin grafts for skin ulcer or cellulitis, age $\geq 70$	0.2	0.1
148	Major large and small bowel procedures <sup>a</sup>	1.1	0.5
113	Amputation for circulatory disorders except upper limb and toe	0.2	0.2
416	Septicemia, age $\geq 18$	0.8	0.2
243	Medical back problems	1.8	1.8
239	Pathological fractures and musculoskeletal and connective tissue malignancy	0.6	0.2
271	Skin ulcers	0.2	0.2
1	Craniotomy, age $\geq 18$ except for trauma	0.2	0.1
87	Pulmonary edema and respiratory failure	1.1	0.5
82	Respiratory neoplasms	1.0	1.2
253	Fractures, sprains, strains, and dislocation of upper arm, lower leg except foot <sup>a</sup>	0.4	0.4
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>		
174	Gastrointestinal hemorrhage <sup>a</sup>	1.5	0.9
Other DRGs That Were Important in 1981			
88	Chronic obstructive pulmonary disease	1.8	2.7
12	Degenerative nervous system disorders	0.4	0.5
130	Peripheral vascular disorders <sup>a</sup>	0.8	1.1
294	Diabetes, age $\geq 36$	1.2	1.9
132	Atherosclerosis <sup>a</sup>	0.6	3.7
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	0.1	0.5
467	Other factors influencing health status	0.1	1.2
470	Ungroupable	0.0	4.4
Total (All DRGs)		100.0	100.0

<sup>a</sup>Age  $\geq 70$  and/or complications.

Table 4.6

PERCENTAGE OF ALL MEDICARE HOSPITAL DISCHARGES ACCOUNTED  
FOR BY DRGS IMPORTANT FOR HOME HEALTH CARE,  
NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	3.1	2.5
127	Heart failure and shock	5.0	3.6
209	Major joint and limb reattachment procedures	1.6	0.8
210	Hip and femur procedures except major joint <sup>a</sup>	1.2	0.6
89	Simple pneumonia and pleurisy <sup>a</sup>	3.5	2.3
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	2.0	1.0
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	3.4	3.8
320	Kidney and urinary tract infections <sup>a</sup>	1.4	1.1
148	Major large and small bowel procedures <sup>a</sup>	1.1	0.5
468	Unrelated operating room procedures	1.4	2.2
88	Chronic obstructive pulmonary disease	1.8	2.7
294	Diabetes, age $\geq 36$	1.2	1.9
140	Angina pectoris	3.3	1.6
243	Medical back problems	1.8	1.8
15	Transient ischemic attack and precerebral occlusions	1.7	1.3
138	Cardiac arrhythmia and conduction disorders <sup>a</sup>	2.1	1.4
96	Bronchitis and asthma <sup>a</sup>	1.9	1.3
87	Pulmonary edema and respiratory failure	1.1	0.5
121	Circulatory disorders with acute myocardial infarction and cardiovascular complications; discharged alive	1.1	N/A
174	Gastrointestinal hemorrhage <sup>a</sup>	1.5	0.9
239	Pathological fractures and musculoskeletal and connective tissue malignancy	0.6	0.2
82	Respiratory neoplasms	1.0	1.2
130	Peripheral vascular disorders <sup>a</sup>	0.8	1.1
Other DRGs That Were Important in 1981			
122	Circulatory disorders with acute myocardial infarction without cardiovascular complications; discharged alive	1.4	1.9
236	Fractures of hip and pelvis	0.4	0.5
12	Degenerative nervous system disorders	0.4	0.5
132	Atherosclerosis <sup>a</sup>	0.6	3.7
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	0.1	0.5
467	Other factors influencing health status	0.1	1.2
470	Ungroupable	0.0	4.4
Total (All DRGs)		100.0	100.0

<sup>a</sup>Age  $\geq 70$  and/or complications.



called DRG 122. By 1984/85, improved assignment algorithms allowed the two DRGs to be distinguished. There really is no alternative to using recorded DRGs as a basis for comparing use of posthospital care in our two sample periods. It is important to keep in mind, though, that patients classified in a particular DRG in one period are not necessarily comparable with patients similarly classified in the other period.

## PROPENSITY TO USE POSTHOSPITAL CARE

Table 4.7 and 4.8 show (for the DRGs listed in Tables 4.1 and 4.2) the fraction of Medicare discharges in each DRG who used posthospital care. The principal message of these tables is that the overall trend described in Sec. III (i.e., patients were more likely in the post-PPS period to use both SNF and home health care) generally holds for all important DRGs. Thus, the overall increase in SNF use does not appear to be due simply to a change in case mix. Rather, there seems to be a real increase in the likelihood that Medicare patients—in all DRGs—will use SNF care. Only three of the 23 important DRGs listed in Table 4.7 (127, heart failure and shock; 236, fractures of hip and pelvis; and 113 amputation) showed a declining propensity to use SNF care. One other DRG (1, craniotomy) stayed the same. Four of the formerly important DRGs showed declining propensities to use SNF care, but coding changes may have rendered the patients assigned to these DRGs in the two periods noncomparable.<sup>2</sup> With one exception, all of the DRGs listed in Table 4.8 show higher propensities to use home health care in the post-PPS period. (The exception, not surprisingly, is DRG 233.)

For the sake of completeness, Table 4.9 shows propensities to use rehabilitation care for some selected DRGs.

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<sup>2</sup>For DRG 233 (other musculoskeletal and connective tissue procedures), for example, the decline in propensity to use SNF care was particularly dramatic. Table 4.5 shows, however, that this DRG was only about one-fifth as common among all Medicare hospital discharges in the post-PPS period as it was in the pre-PPS period. This suggests that the patients included in this DRG are rather different sorts in the two periods.

Table 4.7

## PERCENTAGE OF DISCHARGES USING SNF CARE, NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	13.3	11.9 <sup>a</sup>
210	Hip and femur procedures except major joint <sup>b</sup>	31.1	28.4 <sup>a</sup>
209	Major joint and limb reattachment procedures	15.7	14.0 <sup>a</sup>
89	Simple pneumonia and pleurisy <sup>b</sup>	3.5	2.9 <sup>a</sup>
296	Nutritional and miscellaneous metabolic disorders <sup>b</sup>	4.7	4.4
127	Heart failure and shock	2.1	2.2
468	Unrelated operating room procedures	4.6	3.6 <sup>a</sup>
236	Fractures of hip and pelvis	14.8	14.9
79	Respiratory infections and inflammations <sup>b</sup>	8.4	5.4 <sup>a</sup>
320	Kidney and urinary tract infections <sup>b</sup>	4.6	3.3 <sup>a</sup>
263	Skin grafts for skin ulcer or cellulitis, age $\geq 70$	15.6	11.3 <sup>a</sup>
148	Major large and small bowel procedures <sup>b</sup>	4.2	4.1
113	Amputation for circulatory disorders except upper limb and toe	16.0	16.7
416	Septicemia, age $\geq 18$	6.2	5.3 <sup>a</sup>
243	Medical back problems	2.1	1.8 <sup>a</sup>
239	Pathological fractures and musculoskeletal and connective tissue malignancy	5.8	4.5 <sup>a</sup>
271	Skin ulcers	10.8	9.6
1	Craniotomy, age $\geq 18$ except for trauma	9.5	9.5
87	Pulmonary edema and respiratory failure	2.9	2.1 <sup>a</sup>
82	Respiratory neoplasms	3.6	2.5 <sup>a</sup>
253	Fractures, sprains, strains, and dislocation of upper arm, lower leg except foot <sup>b</sup>	7.3	6.5 <sup>a</sup>
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>b</sup>	1.0	0.8 <sup>a</sup>
174	Gastrointestinal hemorrhage <sup>b</sup>	2.2	2.1
Other DRGs That Were Important in 1981			
88	Chronic obstructive pulmonary disease	1.5	1.4
12	Degenerative nervous system disorders	5.1	7.2 <sup>a</sup>
130	Peripheral vascular disorders <sup>b</sup>	2.7	2.7
294	Diabetes, age $\geq 36$	2.2	2.0 <sup>a</sup>
132	Atherosclerosis <sup>b</sup>	1.1	1.6 <sup>a</sup>
233	Other musculoskeletal and connective tissue operating room procedures <sup>b</sup>	5.6	23.5 <sup>a</sup>
467	Other factors influencing health status	1.1	1.9 <sup>a</sup>
470	Ungroupable	6.2	1.7 <sup>a</sup>
Total (All DRGs)		3.1	2.5

<sup>a</sup>Difference between two periods significant at 95 percent level.<sup>b</sup>Age  $\geq 70$  and/or complications.

Table 4.8

PERCENTAGE OF DISCHARGES USING HOME HEALTH CARE,  
NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	21.7	16.4 <sup>a</sup>
127	Heart failure and shock	17.8	11.9 <sup>a</sup>
209	Major joint and limb reattachment procedures	32.0	21.7 <sup>a</sup>
210	Hip and femur procedures except major joint <sup>b</sup>	31.5	21.1 <sup>a</sup>
89	Simple pneumonia and pleurisy <sup>b</sup>	12.1	7.6 <sup>a</sup>
296	Nutritional and miscellaneous metabolic disorders <sup>b</sup>	18.3	12.9 <sup>a</sup>
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>b</sup>	9.8	5.4 <sup>a</sup>
320	Kidney and urinary tract infections <sup>b</sup>	17.7	12.2 <sup>a</sup>
148	Major large and small bowel procedures <sup>b</sup>	22.0	17.6 <sup>a</sup>
468	Unrelated operating room procedures	16.6	10.7 <sup>a</sup>
88	Chronic obstructive pulmonary disease	16.1	10.1 <sup>a</sup>
294	Diabetes, age $\geq 36$	21.7	14.5 <sup>a</sup>
140	Angina pectoris	8.3	5.3 <sup>a</sup>
243	Medical back problems	12.3	7.3 <sup>a</sup>
15	Transient ischemic attack and precerebral occlusions	12.0	8.0 <sup>a</sup>
138	Cardiac arrhythmia and conduction disorders <sup>b</sup>	10.3	6.9 <sup>a</sup>
96	Bronchitis and asthma <sup>b</sup>	11.8	7.3 <sup>a</sup>
87	Pulmonary edema and respiratory failure	16.2	10.2
121	Circulatory disorders with acute myocardial infarction and cardiovascular complications; discharged alive	17.6	N/A <sup>a</sup>
174	Gastrointestinal hemorrhage <sup>b</sup>	10.8	7.1 <sup>a</sup>
239	Pathological fractures and musculoskeletal and connective tissue malignancy	23.7	15.4 <sup>a</sup>
82	Respiratory neoplasms	15.5	11.0 <sup>a</sup>
130	Peripheral vascular disorders <sup>b</sup>	14.8	10.1 <sup>a</sup>
Other DRGs That Were Important in 1981			
122	Circulatory disorders with acute myocardial infarction without cardiovascular complications; discharged alive	10.4	8.3 <sup>a</sup>
236	Fractures of hip and pelvis	25.2	17.6 <sup>a</sup>
12	Degenerative nervous system disorders	21.9	16.3 <sup>a</sup>
132	Atherosclerosis <sup>b</sup>	10.5	8.6 <sup>a</sup>
233	Other musculoskeletal and connective tissue operating room procedures <sup>b</sup>	16.8	21.9 <sup>a</sup>
467	Other factors influencing health status	7.5	7.5
470	Ungroupable	14.1	7.9 <sup>a</sup>
Total (All DRGs)		13.3	8.5

<sup>a</sup>Difference between two periods significant at 95 percent level.

<sup>b</sup>Age  $\geq 70$  and/or complications.

Table 4.9

PERCENTAGE OF DISCHARGES USING REHABILITATION CARE,  
NONWAIVERED STATES

DRG	Description	1984/85
14	Specific cerebrovascular disorders except transient ischemic attack	6.8
210	Hip and femur procedures except major joint <sup>a</sup>	2.9
209	Major hip procedures	2.4
1	Craniotomy, age $\geq 18$ except for trauma	8.0
468	Unrelated operating room procedure	0.9
214	Back and neck procedures <sup>a</sup>	3.4
5	Extracranial vascular procedures	1.3
113	Amputation for circulatory system disorders except upper limb and toe	4.3
12	Degenerative nervous system disorders	2.4
15	Transient ischemic attack	0.4
285	Amputations for endocrine, nutritional, and metabolic disorders	5.5
110	Major reconstructive vascular procedures <sup>a</sup>	0.9
Total (All DRGs)		0.6

<sup>a</sup>Age  $\geq 70$  and/or complications.

## SNF LENGTH OF STAY AND NUMBER OF HOME HEALTH VISITS

Table 4.10 shows the average number of covered days of SNF care for all patients in "important" DRGs who actually used SNF care. These figures confirm that the overall tendency toward shorter SNF stays noted in Sec. III generally holds across the board. For all but two DRGs shown in the table, average SNF length of stay declined. (The exceptions are DRGs strongly affected by changed coding procedures: 470, ungroupable; and 467, other factors influencing health status.)

Table 4.11 shows the average number of home health care visits for each home health care user in each "important" DRG, using the maximalist definition of an episode. This table confirms the general trend toward more home health care visits. The only exceptions to this trend visible in the table are DRGs 12 (degenerative nervous system disorders) and 233 (other musculoskeletal and connective tissue procedures)—both DRGs that are no longer among the top DRGs for home health care. Table 4.12 shows similar figures for the extended



Table 4.10

AVERAGE NUMBER OF COVERED DAYS OF SNF CARE PER USER,  
NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	30.2	35.4
210	Hip and femur procedures except major joint <sup>a</sup>	29.6	33.8
209	Major joint and limb reattachment procedures	23.5	27.7
89	Simple pneumonia and pleurisy <sup>a</sup>	20.9	23.7
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	25.9	31.2
127	Heart failure and shock	19.7	22.0
468	Unrelated operating room procedures	26.7	31.0
236	Fractures of hip and pelvis	23.7	31.4
79	Respiratory infections and inflammations <sup>a</sup>	25.0	29.8
320	Kidney and urinary tract infections <sup>a</sup>	26.1	28.5
263	Skin grafts for skin ulcer or cellulitis, age $\geq 70$	35.5	44.3
148	Major large and small bowel procedures <sup>a</sup>	21.9	27.6
113	Amputation for circulatory disorders except upper limb and toe	30.4	37.8
416	Septicemia, age $\geq 18$	25.1	27.7
243	Medical back problems	20.1	23.5
239	Pathological fractures and musculoskeletal and connective tissue malignancy	20.9	27.1
271	Skin ulcers	35.3	42.0
1	Craniotomy, age $\geq 18$ except for trauma	28.4	35.4
87	Pulmonary edema and respiratory failure	20.2	22.2
82	Respiratory neoplasms	17.1	22.0
253	Fractures, sprains, strains, and dislocation of upper arm, lower leg except foot <sup>a</sup>	26.7	31.2
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	23.4	25.1
174	Gastrointestinal hemorrhage <sup>a</sup>	21.2	22.8
Other DRGs That Were Important in 1981			
88	Chronic obstructive pulmonary disease	17.1	23.9
12	Degenerative nervous system disorders	29.8	31.2
130	Peripheral vascular disorders <sup>a</sup>	25.8	31.6
294	Diabetes, age $\geq 36$	23.1	29.2
132	Atherosclerosis <sup>a</sup>	21.2	25.8
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	25.7	34.6
467	Other factors influencing health status	30.3	26.3
470	Ungroupable	37.5	31.4
Total (All DRGs)		25.1	29.6

<sup>a</sup>Age  $\geq 70$  and/or complications.

Table 4.11

AVERAGE NUMBER OF COVERED HOME HEALTH VISITS PER USER,  
MAXIMALIST DEFINITION, NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	18.7	17.3
127	Heart failure and shock	12.6	11.4
209	Major joint and limb reattachment procedures	16.3	15.8
210	Hip and femur procedures except major joint <sup>a</sup>	17.8	16.0
89	Simple pneumonia and pleurisy,	13.1	11.6
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	13.9	12.2
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	12.3	11.1
320	Kidney and urinary tract infections <sup>a</sup>	15.3	13.1
148	Major large and small bowel procedures <sup>a</sup>	14.7	13.3
468	Unrelated operating room procedures	15.2	14.6
88	Chronic obstructive pulmonary disease	12.2	10.9
294	Diabetes, age $\geq 36$	13.3	11.7
140	Angina pectoris	12.1	10.5
243	Medical back problems	14.4	12.9
15	Transient ischemic attack and precerebral occlusions	13.5	12.2
138	Cardiac arrhythmia and conduction disorders <sup>a</sup>	12.3	11.3
96	Bronchitis and asthma <sup>a</sup>	11.9	10.8
87	Pulmonary edema and respiratory failure	13.3	11.5
121	Circulatory disorders with acute myocardial infarction and cardiovascular complications; discharged alive	12.0	N/A
174	Gastrointestinal hemorrhage <sup>a</sup>	12.9	11.9
239	Pathological fractures and musculoskeletal and connective tissue malignancy	14.6	14.4
82	Respiratory neoplasms	11.6	10.7
130	Peripheral vascular disorders <sup>a</sup>	15.1	13.7
Other DRGs That Were Important in 1981			
122	Circulatory disorders with acute myocardial infarction without cardiovascular complications; discharged alive	12.2	11.0
236	Fractures of hip and pelvis	15.5	14.5
12	Degenerative nervous system disorders	16.0	16.4
132	Atherosclerosis <sup>a</sup>	12.4	11.4
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	15.8	17.7
467	Other factors influencing health status	16.8	13.6
470	Ungroupable	20.1	12.6
Total (All DRGs)		14.1	12.8

<sup>a</sup>Age  $\geq 70$  and/or complications.

Table 4.12

AVERAGE NUMBER OF COVERED HOME HEALTH VISITS PER USER,  
EXTENDED DEFINITION, NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	29.0	27.1
127	Heart failure and shock	17.9	16.6
209	Major joint and limb reattachment procedures	20.1	20.5
210	Hip and femur procedures except major joint <sup>a</sup>	23.5	22.4
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	21.0	19.0
89	Simple pneumonia and pleurisy <sup>a</sup>	18.9	17.5
320	Kidney and urinary tract infections <sup>a</sup>	26.5	22.8
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	18.3	17.5
468	Unrelated operating room procedures	21.8	20.5
88	Chronic obstructive pulmonary disease	17.5	15.7
294	Diabetes, age $\geq 36$	19.3	18.0
140	Angina pectoris	17.9	15.5
148	Major large and small bowel procedures <sup>a</sup>	18.3	16.3
243	Medical back problems	19.4	17.7
15	Transient ischemic attack and precerebral occlusions	20.4	18.1
138	Cardiac arrhythmia and conduction disorders <sup>a</sup>	17.6	16.4
96	Bronchitis and asthma <sup>a</sup>	17.3	15.6
87	Pulmonary edema and respiratory failure	18.5	15.8
174	Gastrointestinal hemorrhage <sup>a</sup>	19.9	18.4
121	Circulatory disorders with acute myocardial infarction and cardiovascular complications; discharged alive	15.8	N/A
239	Pathological fractures and musculoskeletal and connective tissue malignancy	20.2	20.2
130	Peripheral vascular disorders <sup>a</sup>	24.0	21.5
416	Septicemia, age $>$	18	23.1
Other DRGs That Were Important in 1981			
12	Degenerative nervous system disorders	24.1	26.3
82	Respiratory neoplasms	14.8	13.9
122	Circulatory disorders with acute myocardial infarction without cardiovascular complications; discharged alive	16.3	14.6
132	Atherosclerosis <sup>a</sup>	18.5	17.2
134	Hypertension	19.2	19.0
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	22.0	24.0
236	Fractures of hip and pelvis	20.1	20.8
467	Other factors influencing health status	28.9	19.8
470	Ungroupable	31.6	21.0
Total (All DRGs)		20.2	18.9

<sup>a</sup>Age  $\geq 70$  and/or complications.

definition of an episode. Once again, the general trend toward more home health visits is apparent across the board, although there are three additional exceptions to the general rule when we shift to the extended definition: DRG 209 (major joint and limb procedures), DRG 416 (septicemia), and DRG 236 (fractures of the hip and pelvis).

## **COVERED CHARGES PER DAY AND PER VISIT**

Table 4.13 shows average covered charges per day of SNF care for the "important" DRGs. Not surprisingly, covered charges per day rose for all of the DRGs shown. The amount of the rise, however, varied considerably—from 30.2 percent for DRG 253 (fractures, sprains, strains, and dislocations of upper arm and lower leg) to 60.9 percent for DRG 148 (major large and small bowel procedures). We have no good explanation for why increases were larger for some DRGs than for others.

Table 4.14 shows average covered charges per home health visit for "important" DRGs using the maximalist definition of an episode. Table 4.15 shows similar figures for the extended definition. The message of these two tables is that a home health visit is much the same whatever the DRG and whatever the definition of an episode. The average cost per visit is about the same for all the DRGs shown and the rate of increase is much the same for all DRGs. Neither is there much difference in average charges from one definition to the other.

## **AGE OF POSTHOSPITAL CARE USERS**

Tables 4.16 and 4.17 show the average ages of SNF users and non-users in 1981 and in 1984/85. Overall, the average age of SNF users rose a bit—from 79.4 in 1981 to 79.7 in 1984/85—but somewhat less than the average age of nonusers. This is consistent with the observation, made above, that younger Medicare patients showed greater increases in propensity to use posthospital care than did older Medicare patients. Different DRGs showed differing patterns. For 15 of the DRGs shown in Table 4.16, the average age of SNF users rose; and for 15 DRGs, it fell. For the most part, changes in the average age of SNF users reflect changes in the average age of all Medicare hospital patients in the DRG. For only three DRGs shown in the table were there opposite movements in the average ages of users and nonusers: DRG 79 (respiratory infections and inflammations), DRG 1 (craniotomy), and DRG 253 (fractures, strains, sprains, and dislocations). Despite an overall trend toward increased SNF use by the



Table 4.13

COVERED CHARGES PER DAY OF SNF CARE, NOT ADJUSTED  
FOR PATIENT COPAYMENT, NONWAIVERED STATES  
(In dollars)

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	122.02	85.22
210	Hip and femur procedures except major joint <sup>a</sup>	110.63	78.95
209	Major joint and limb reattachment procedures	118.49	84.82
89	Simple pneumonia and pleurisy <sup>a</sup>	104.60	70.83
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	99.32	70.09
127	Heart failure and shock	105.54	74.31
468	Unrelated operating room procedures	114.90	82.26
236	Fractures of hip and pelvis	111.80	79.48
79	Respiratory infections and inflammations <sup>a</sup>	112.52	76.40
320	Kidney and urinary tract infections <sup>a</sup>	97.95	66.68
263	Skin grafts for skin ulcer or cellulitis, age $\geq 70$	125.68	82.65
148	Major large and small bowel procedures <sup>a</sup>	109.40	68.00
113	Amputation for circulatory disorders except upper limb and toe	111.17	80.56
416	Septicemia, age $\geq 18$	104.33	69.31
243	Medical back problems	119.55	85.87
239	Pathological fractures and musculoskeletal and connective tissue malignancy	120.62	77.67
271	Skin ulcers	114.14	78.65
1	Craniotomy age $\geq 18$ except for trauma	136.66	93.84
87	Pulmonary edema and respiratory failure	126.12	81.53
82	Respiratory neoplasms	120.86	87.73
253	Fractures, sprains, strains and dislocation of upper arm, lower leg except foot <sup>a</sup>	107.16	82.28
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	102.90	74.29
174	Gastrointestinal hemorrhage <sup>a</sup>	108.71	71.26
Other DRGs That Were Important in 1981			
88	Chronic obstructive pulmonary disease	136.26	82.74
12	Degenerative nervous system disorders	114.83	81.55
130	Peripheral vascular disorders <sup>a</sup>	114.53	75.97
294	Diabetes, age $\geq 36$	107.24	78.22
132	Atherosclerosis <sup>a</sup>	106.54	74.59
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	105.10	79.19
467	Other factors influencing health status	113.44	85.99
470	Ungroupable	102.60	83.40
Total (All DRGs)		114.45	79.72

<sup>a</sup>Age  $\geq 70$  and/or complications.

Table 4.14

COVERED CHARGES PER HOME HEALTH VISIT, MAXIMALIST  
DEFINITION, NONWAIVERED STATES  
(In dollars)

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	54.08	40.71
127	Heart failure and shock	52.48	39.34
209	Major joint and limb reattachment procedures	53.39	39.48
210	Hip and femur procedures except major joint <sup>a</sup>	53.69	39.54
89	Simple pneumonia and pleurisy <sup>a</sup>	52.94	38.94
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	53.91	39.62
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	52.50	38.50
320	Kidney and urinary tract infections <sup>a</sup>	54.04	39.61
148	Major large and small bowel procedures <sup>a</sup>	55.13	40.55
468	Unrelated operating room procedures	54.03	40.29
88	Chronic obstructive pulmonary disease	53.37	40.14
294	Diabetes, age $\geq 36$	53.59	39.14
140	Angina pectoris	52.47	38.82
243	Medical back problems	51.82	38.52
15	Transient ischemic attack and precerebral occlusions	52.39	39.31
138	Cardiac arrhythmia and conduction disorders <sup>a</sup>	53.32	39.77
96	Bronchitis and asthma <sup>a</sup>	53.18	40.00
87	Pulmonary edema and respiratory failure	54.40	39.04
121	Circulatory disorders with acute myocardial infarction and cardiovascular complications; discharged alive	52.71	N/A
174	Gastrointestinal hemorrhage <sup>a</sup>	53.46	38.74
239	Pathological fractures and musculoskeletal and connective tissue malignancy	52.58	40.74
82	Respiratory neoplasms	52.83	41.15
130	Peripheral vascular disorders <sup>a</sup>	52.56	39.49
Other DRGs That Were Important in 1981			
122	Circulatory disorders with acute myocardial infarction without cardiovascular complications; discharged alive	52.44	38.52
236	Fractures of hip and pelvis	53.45	39.71
12	Degenerative nervous system disorders	52.21	40.27
132	Atherosclerosis <sup>a</sup>	52.01	38.87
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	54.33	40.53
467	Other factors influencing health status	53.93	41.54
470	Ungroupable	52.36	37.39
Total (All DRGs)		52.57	39.55

<sup>a</sup>Age  $\geq 70$  and/or complications.

Table 4.15

COVERED CHARGES PER HOME HEALTH VISIT, EXTENDED  
DEFINITION, NONWAIVERED STATES  
(In dollars)

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	53.79	40.24
127	Heart failure and shock	52.00	38.87
209	Major joint and limb reattachment procedures	52.89	38.95
210	Hip and femur procedures except major joint <sup>a</sup>	53.43	39.06
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	53.24	39.22
89	Simple pneumonia and pleurisy <sup>a</sup>	52.77	38.76
320	Kidney and urinary tract infections <sup>a</sup>	53.76	39.92
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	52.52	37.93
468	Unrelated operating room procedures	53.59	39.85
88	Chronic obstructive pulmonary disease	52.91	40.21
294	Diabetes, age $\geq 36$	52.96	38.73
140	Angina pectoris	51.89	38.29
148	Major large and small bowel procedures <sup>a</sup>	54.82	40.47
243	Medical back problems	51.35	38.16
15	Transient ischemic attack and precerebral occlusions	52.20	38.97
138	Cardiac arrhythmia and conduction disorders <sup>a</sup>	52.94	39.21
96	Bronchitis and asthma <sup>a</sup>	52.90	39.78
87	Pulmonary edema and respiratory failure	53.87	38.71
174	Gastrointestinal hemorrhage <sup>a</sup>	53.11	38.57
121	Circulatory disorders with acute myocardial infarction and cardiovascular complications; discharged alive	52.31	N/A
239	Pathological fractures and musculoskeletal and connective tissue malignancy	52.38	40.95
130	Peripheral vascular disorders <sup>a</sup>	52.16	39.44
416	Septicemia, age $\geq 18$	54.54	40.25
Other DRGs That Were Important in 1981			
12	Degenerative nervous system disorders	51.50	39.75
82	Respiratory neoplasms	52.63	40.65
122	Circulatory disorders with acute myocardial infarction without cardiovascular complications; discharged alive	51.37	38.20
132	Atherosclerosis <sup>a</sup>	52.19	38.63
134	Hypertension	52.88	39.62
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	54.31	40.21
236	Fractures of hip and pelvis	52.92	39.64
467	Other factors influencing health status	53.20	40.99
470	Ungroupable	53.30	37.02
Total (All DRGs)		53.19	39.23

<sup>a</sup>Age  $\geq 70$  and/or complications.

Table 4.16

## AVERAGE AGE OF USERS OF SNF CARE, NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	79.6	78.9
210	Hip and femur procedures except major joint <sup>a</sup>	82.6	82.9
209	Major joint and limb reattachment procedures	80.6	80.3
89	Simple pneumonia and pleurisy <sup>a</sup>	81.7	82.0
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	80.9	81.3
127	Heart failure and shock	81.6	81.2
468	Unrelated operating room procedures	78.6	78.2
236	Fractures of hip and pelvis	83.0	82.3
79	Respiratory infections and inflammations <sup>a</sup>	80.2	79.9
320	Kidney and urinary tract infections <sup>a</sup>	81.2	81.4
263	Skin grafts for skin ulcer or cellulitis, age $\geq 70$	78.7	81.3
148	Major large and small bowel procedures <sup>a</sup>	80.2	81.6
113	Amputation for circulatory disorders except upper limb and toe	80.0	78.9
416	Septicemia, age $\geq 18$	80.2	79.5
243	Medical back problems	80.9	80.8
239	Pathological fractures and musculoskeletal and connective tissue malignancy	78.3	77.2
271	Skin ulcers	80.0	79.7
1	Craniotomy, age $\geq 18$ except for trauma	74.4	74.5
87	Pulmonary edema and respiratory failure	76.5	77.6
82	Respiratory neoplasms	75.1	74.0
253	Fractures, sprains, strains and dislocation of upper arm, lower leg except foot <sup>a</sup>	80.2	81.0
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	80.1	81.4
174	Gastrointestinal hemorrhage <sup>a</sup>	81.2	82.4
Other DRGs That Were Important in 1981			
88	Chronic obstructive pulmonary disease	75.7	75.3
12	Degenerative nervous system disorders	77.4	76.6
130	Peripheral vascular disorders <sup>a</sup>	80.6	80.7
294	Diabetes, age $\geq 36$	77.9	76.5
132	Atherosclerosis <sup>a</sup>	81.2	81.7
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	79.4	82.9
467	Other factors influencing health status	78.1	78.8
470	Ungroupable	76.4	79.1
Total (All DRGs)		79.7	79.4

<sup>a</sup>Age  $\geq 70$  and/or complications.



Table 4.17

## AVERAGE AGE OF NONUSERS OF SNF CARE, NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	76.8	76.3
210	Hip and femur procedures except major joint <sup>a</sup>	80.3	80.6
209	Major joint and limb reattachment procedures	74.3	73.9
89	Simple pneumonia and pleurisy <sup>a</sup>	77.5	78.5
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	77.2	77.7
127	Heart failure and shock	76.7	76.4
468	Unrelated operating room procedures	71.8	70.9
236	Fractures of hip and pelvis	80.3	79.5
79	Respiratory infections and inflammations <sup>a</sup>	77.0	77.5
320	Kidney and urinary tract infections <sup>a</sup>	77.2	77.6
263	Skin grafts for skin ulcer or cellulitis, age $\geq 70$	73.2	75.0
148	Major large and small bowel procedures <sup>a</sup>	75.4	76.2
113	Amputation for circulatory disorders except upper limb and toe	76.9	75.9
416	Septicemia, age $\geq 18$	76.4	75.4
243	Medical back problems	71.9	71.1
239	Pathological fractures and musculoskeletal and connective tissue malignancy	75.5	73.3
271	Skin ulcers	75.2	73.5
1	Craniotomy age $\geq 18$ except for trauma	70.6	69.2
87	Pulmonary edema and respiratory failure	72.7	73.8
82	Respiratory neoplasms	72.2	71.2
253	Fractures, sprains, strains and dislocation of upper arm, lower leg except foot <sup>a</sup>	78.0	77.6
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	75.3	75.9
174	Gastrointestinal hemorrhage <sup>a</sup>	76.9	77.2
Other DRGs That Were Important in 1981			
88	Chronic obstructive pulmonary disease	71.4	71.1
12	Degenerative nervous system disorders	74.1	73.3
130	Peripheral vascular disorders <sup>a</sup>	75.5	76.8
294	Diabetes, age $\geq 36$	71.1	71.0
132	Atherosclerosis <sup>a</sup>	74.9	76.4
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	74.1	77.8
467	Other factors influencing health status	71.7	72.0
470	Ungroupable	70.3	72.2
Total (All DRGs)		73.3	72.6

<sup>a</sup>Age  $\geq 70$  and/or complications.

younger groups of Medicare patients, then, it seems that within particular DRGs the age of SNF patients has been affected principally by the underlying changes in the ages of Medicare hospital patients.

Tables 4.18 and 4.19 show similar statistics for home health care users and nonusers. Overall, home health care users have aged a bit, but so have nonusers. As with SNF care, the pattern varies from DRG to DRG, but the general rule seems to be that changes in the age of users reflect changes in the age of all patients in that DRG.

## SEX OF POSTHOSPITAL CARE USERS

Table 4.20 shows the fraction of SNF users pre- and post-PPS who were female, both overall and for selected DRGs. In both periods, women constituted a sizable majority of SNF patients, although the size of this majority declined slightly from 1981 to 1984/85 (from 67.3 percent to 66.8 percent). The patterns for individual DRGs are mixed, and there are some fairly dramatic shifts. The fraction of women among SNF users rose sharply for DRGs 82 (respiratory neoplasms) and 416 (septicemia) and fell sharply for DRGs 148 (major large and small bowel procedures), 296 (nutritional and metabolic disorders), and 468 (unrelated operating room procedures).

Table 4.21 shows the fraction of all Medicare-covered SNF days accounted for by women. The predominance of women in SNFs is slightly more pronounced in this measure than in a simple count of patients; women have slightly longer SNF stays on average than do men. Unlike what we saw in Table 4.20, however, Table 4.21 shows no decline in the fraction of SNF days accounted for by women.

Tables 4.22 and 4.23 offer some insights into why the shifts evident in Tables 4.20 and 4.21 may have occurred. Both males and females were more likely to use SNF care in 1984/85 than in 1981—both overall and for most DRGs. There were some interesting differences though. Note, for example, that women in DRG 148 became less likely to use SNF care, whereas men in the same DRG became more likely to use it.

Tables 4.24 through 4.27 offer information about the sex of home health care users. The majority of home health care users in both periods are female, although the predominance of women is not as pronounced for home health care as for SNF care. Overall, the fraction of female home health patients did not change very much from the pre- to the post-PPS period (Table 4.24). As with SNF care, though, there were a couple of dramatic changes: sharp rises in the fraction of women home health patients in DRGs 88 (chronic obstructive pulmonary disease) and 82 (respiratory neoplasms). These same patterns are visible when we count the fraction of all home health visits

Table 4.18

## AVERAGE AGE OF USERS OF HOME HEALTH CARE, NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	76.8	76.1
127	Heart failure and shock	78.5	78.1
209	Major joint and limb reattachment procedures	75.9	76.0
210	Hip and femur procedures except major joint <sup>a</sup>	79.7	80.4
89	Simple pneumonia and pleurisy <sup>a</sup>	78.6	79.7
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	78.2	79.6
182	Esophagitis, gastroenteritis, and miscellaneous disorders <sup>a</sup>	77.8	79.1
320	Kidney and urinary tract infections <sup>a</sup>	78.0	79.2
148	Major large and small bowel procedures <sup>a</sup>	76.2	76.9
468	Unrelated operating room procedures	75.0	73.8
88	Chronic obstructive pulmonary disease	73.2	73.0
294	Diabetes, age $\geq 36$	73.4	73.5
140	Angina pectoris	77.2	76.5
243	Medical back problems	77.9	77.8
15	Transient ischemic attack and precerebral occlusions	79.1	78.8
138	Cardiac arrhythmia and conduction disorders <sup>a</sup>	79.1	79.7
96	Bronchitis and asthma <sup>a</sup>	75.8	77.2
87	Pulmonary edema and respiratory failure	73.1	74.9
121	Circulatory disorders with acute myocardial infarction and cardiovascular complications; discharged alive	77.3	N/A
174	Gastrointestinal hemorrhage <sup>a</sup>	78.6	79.5
239	Pathological fractures and musculoskeletal and connective tissue malignancy	76.3	74.3
82	Respiratory neoplasms	72.9	72.1
130	Peripheral vascular disorders <sup>a</sup>	77.3	78.4
Other DRGs That Were Important in 1981			
122	Circulatory disorders with acute myocardial infarction without cardiovascular complications; discharged alive	76.3	76.3
236	Fractures of hip and pelvis	80.3	79.8
12	Degenerative nervous system disorders	75.2	74.6
132	Atherosclerosis <sup>a</sup>	78.5	79.4
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	76.5	79.9
467	Other factors influencing health status	75.4	75.6
470	Ungroupable	74.0	76.1
Total (All DRGs)		76.1	75.9

<sup>a</sup>Age  $\geq 70$  and/or complications.

Table 4.19

AVERAGE AGE OF NONUSERS OF HOME HEALTH CARE,  
NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	77.3	76.7
127	Heart failure and shock	76.5	76.3
209	Major joint and limb reattachment procedures	75.0	74.5
210	Hip and femur procedures except major joint <sup>a</sup>	81.6	81.4
89	Simple pneumonia and pleurisy <sup>a</sup>	77.5	78.5
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	77.1	77.6
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	75.1	75.7
320	Kidney and urinary tract infections <sup>a</sup>	77.3	77.5
148	Major large and small bowel procedures <sup>a</sup>	75.4	76.4
468	Unrelated operating room procedures	71.5	70.9
88	Chronic obstructive pulmonary disease	71.2	71.0
294	Diabetes, age $\geq 36$	70.7	70.7
140	Angina pectoris	72.3	71.0
243	Medical back problems	71.3	70.8
15	Transient ischemic attack and precerebral occlusions	76.0	75.4
138	Cardiac arrhythmia and conduction disorders <sup>a</sup>	75.8	76.2
96	Bronchitis and asthma <sup>a</sup>	73.1	74.4
87	Pulmonary edema and respiratory failure	72.7	73.8
121	Circulatory disorders with acute myocardial infarction and cardiovascular complications; discharged alive	74.2	N/A
174	Gastrointestinal hemorrhage <sup>a</sup>	76.8	77.2
239	Pathological fractures and musculoskeletal and connective tissue malignancy	75.5	73.3
82	Respiratory neoplasms	72.2	71.1
130	Peripheral vascular disorders <sup>a</sup>	75.4	76.7
Other DRGs That Were Important in 1981			
122	Circulatory disorders with acute myocardial infarction without cardiovascular complications; discharged alive	71.8	72.1
236	Fractures of hip and pelvis	80.8	80.0
12	Degenerative nervous system disorders	74.1	73.3
132	Atherosclerosis <sup>a</sup>	74.6	76.2
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	73.9	78.8
467	Other factors influencing health status	71.5	71.8
470	Ungroupable	70.2	72.0
Total (All DRGs)		73.1	72.5

<sup>a</sup>Age  $\geq 70$  and/or complications.



Table 4.20

## PERCENTAGE OF FEMALE SNF CARE USERS, NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	64.4	63.6
210	Hip and femur procedures except major joint <sup>a</sup>	80.9	83.2
209	Major joint and limb reattachment procedures	80.9	85.1
89	Simple pneumonia and pleurisy <sup>a</sup>	56.2	52.5
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	63.4	70.5
127	Heart failure and shock	65.5	66.1
468	Unrelated operating room procedures	55.7	61.6
236	Fractures of hip and pelvis	82.7	81.7
79	Respiratory infections and inflammations <sup>a</sup>	49.4	46.0
320	Kidney and urinary tract infections <sup>a</sup>	66.7	62.1
263	Skin grafts for skin ulcer or cellulitis, age $\geq 70$	68.3	68.4
148	Major large and small bowel procedures <sup>a</sup>	69.1	77.1
113	Amputation for circulatory disorders except upper limb and toe	57.0	55.8
416	Septicemia, age $\geq 18$	60.2	54.7
243	Medical back problems	79.1	77.1
239	Pathological fractures and musculoskeletal and connective tissue malignancy	73.2	75.4
271	Skin ulcers	67.0	69.3
1	Craniotomy age $\geq 18$ except for trauma	58.8	61.2
87	Pulmonary edema and respiratory failure	59.3	59.0
82	Respiratory neoplasms	43.7	37.0
253	Fractures, sprains, strains and dislocation of upper arm, lower leg except foot <sup>a</sup>	86.0	83.4
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	71.2	74.8
174	Gastrointestinal hemorrhage <sup>a</sup>	66.1	67.1
Other DRGs That Were Important in 1981			
88	Chronic obstructive pulmonary disease	50.3	44.9
12	Degenerative nervous system disorders	53.6	56.8
130	Peripheral vascular disorders <sup>a</sup>	69.0	63.3
294	Diabetes, age $\geq 36$	69.8	67.2
132	Atherosclerosis <sup>a</sup>	69.8	66.1
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	79.5	82.0
467	Other factors influencing health status	75.0	66.6
470	Ungroupable	45.5	72.2
Total (All DRGs)		66.8	67.3

<sup>a</sup>Age  $\geq 70$  and/or complications.

Table 4.21

PERCENTAGE OF SNF CARE DAYS USED BY FEMALES,  
NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	67.1	65.9
210	Hip and femur procedures except major joint <sup>a</sup>	82.6	83.7
209	Major joint and limb reattachment procedures	81.5	85.2
89	Simple pneumonia and pleurisy <sup>a</sup>	61.9	55.7
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	65.1	73.3
127	Heart failure and shock	68.2	69.3
468	Unrelated operating room procedures	60.5	62.3
236	Fractures of hip and pelvis	81.6	82.4
79	Respiratory infections and inflammations <sup>a</sup>	54.4	50.9
320	Kidney and urinary tract infections <sup>a</sup>	70.3	61.8
263	Skin grafts for skin ulcer or cellulitis, age $\geq 70$	71.3	66.2
148	Major large and small bowel procedures <sup>a</sup>	68.5	81.3
113	Amputation for circulatory disorders except upper limb and toe	59.5	56.3
416	Septicemia, age $\geq 18$	62.7	55.0
243	Medical back problems	80.7	76.0
239	Pathological fractures and musculoskeletal and connective tissue malignancy	72.9	74.6
271	Skin ulcers	72.3	71.6
1	Craniotomy, age $\geq 18$ except for trauma	63.5	66.3
87	Pulmonary edema and respiratory failure	63.2	61.3
82	Respiratory neoplasms	49.9	37.4
253	Fractures, sprains, strains and dislocation of upper arm, lower leg except foot <sup>a</sup>	84.6	82.9
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	72.1	75.3
174	Gastrointestinal hemorrhage <sup>a</sup>	66.5	70.8
Other DRGs That Were Important in 1981			
88	Chronic obstructive pulmonary disease	51.2	46.3
12	Degenerative nervous system disorders	61.5	61.6
130	Peripheral vascular disorders <sup>a</sup>	73.7	63.4
294	Diabetes, age $\geq 36$	69.6	67.6
132	Atherosclerosis <sup>a</sup>	65.7	68.3
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	78.0	84.1
467	Other factors influencing health status	83.2	71.0
470	Ungroupable	49.9	74.5
Total (All DRGs)		69.5	69.5

<sup>a</sup>Age  $\geq 70$  and/or complications.

Table 4.22  
PERCENTAGE OF FEMALE DISCHARGES USING SNF CARE,  
NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	14.9	13.6 <sup>a</sup>
210	Hip and femur procedures except major joint <sup>b</sup>	32.4	29.8 <sup>a</sup>
209	Major joint and limb reattachment procedures	17.9	16.9 <sup>a</sup>
89	Simple pneumonia and pleurisy <sup>b</sup>	3.9	2.9 <sup>a</sup>
296	Nutritional and miscellaneous metabolic disorders <sup>b</sup>	4.5	4.6
127	Heart failure and shock	2.5	2.6
468	Unrelated operating room procedures	5.4	4.4 <sup>a</sup>
236	Fractures of hip and pelvis	15.4	15.4
79	Respiratory infections and inflammations <sup>b</sup>	9.2	6.0 <sup>a</sup>
320	Kidney and urinary tract infections <sup>b</sup>	4.9	3.1 <sup>a</sup>
263	Skin grafts for skin ulcer or cellulitis, age $\geq 70$	17.1	11.7 <sup>a</sup>
148	Major large and small bowel procedures <sup>b</sup>	4.9	5.2
113	Amputation for circulatory disorders except upper limb and toe	18.2	20.1
416	Septicemia, age $\geq 18$	6.6	5.5
243	Medical back problems	2.4	2.0 <sup>a</sup>
239	Pathological fractures and musculoskeletal and connective tissue malignancy	6.2	5.4
271	Skin ulcers	11.6	11.2
1	Craniotomy age $\geq 18$ except for trauma	11.1	11.8
87	Pulmonary edema and respiratory failure	3.6	2.6 <sup>a</sup>
82	Respiratory neoplasms	4.3	3.2 <sup>a</sup>
253	Fractures, sprains, strains and dislocation of upper arm, lower leg except foot <sup>b</sup>	7.7	6.7 <sup>a</sup>
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>b</sup>	1.1	0.8 <sup>a</sup>
174	Gastrointestinal hemorrhage <sup>b</sup>	2.6	2.6
Other DRGs That Were Important in 1981			
88	Chronic obstructive pulmonary disease	1.9	1.9
12	Degenerative nervous system disorders	5.1	8.0 <sup>a</sup>
130	Peripheral vascular disorders <sup>b</sup>	3.5	3.2
294	Diabetes, age $\geq 36$	2.4	2.0 <sup>a</sup>
132	Atherosclerosis <sup>b</sup>	1.3	2.0 <sup>a</sup>
233	Other musculoskeletal and connective tissue operating room procedures <sup>b</sup>	6.3	24.9 <sup>a</sup>
467	Other factors influencing health status	1.4	2.3
470	Ungroupable	5.3	2.1
Total (All DRGs)		3.8	3.1

<sup>a</sup>Difference between two periods significant at 95 percent levels.

<sup>b</sup>Age  $\geq 70$  and/or complications.

Table 4.23

PERCENTAGE OF MALE DISCHARGES USING SNF CARE,  
NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	11.0	9.7 <sup>a</sup>
210	Hip and femur procedures except major joint <sup>b</sup>	26.6	22.9 <sup>a</sup>
209	Major joint and limb reattachment procedures	10.4	7.1 <sup>a</sup>
89	Simple pneumonia and pleurisy <sup>b</sup>	3.1	2.8
296	Nutritional and miscellaneous metabolic disorders <sup>b</sup>	5.0	4.0 <sup>a</sup>
127	Heart failure and shock	1.7	1.7
468	Unrelated operating room procedures	3.8	2.7 <sup>a</sup>
236	Fractures of hip and pelvis	12.6	13.0
79	Respiratory infections and inflammations <sup>b</sup>	7.8	5.0 <sup>a</sup>
320	Kidney and urinary tract infections <sup>b</sup>	4.2	3.8
263	Skin grafts for skin ulcer or cellulitis, age $\geq 70$	13.1	10.5
148	Major large and small bowel procedures <sup>b</sup>	3.2	2.4 <sup>a</sup>
113	Amputation for circulatory disorders except upper limb and toe	13.9	13.8
416	Septicemia, age $\geq 18$	5.7	5.1
243	Medical back problems	1.3	1.2
239	Pathological fractures and musculoskeletal and connective tissue malignancy	4.9	3.0 <sup>a</sup>
271	Skin ulcers	9.5	7.3 <sup>a</sup>
1	Craniotomy, age $\geq 18$ except for trauma	7.9	7.3
87	Pulmonary edema and respiratory failure	2.3	1.7 <sup>a</sup>
82	Respiratory neoplasms	3.1	2.2 <sup>a</sup>
253	Fractures, sprains, strains and dislocation of upper arm, lower leg except foot <sup>b</sup>	5.5	5.4
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>b</sup>	0.9	0.6 <sup>a</sup>
174	Gastrointestinal hemorrhage <sup>b</sup>	1.7	1.6
Other DRGs That Were Important in 1981			
88	Chronic obstructive pulmonary disease	1.3	1.2
12	Degenerative nervous system disorders	5.2	6.4 <sup>a</sup>
130	Peripheral vascular disorders <sup>b</sup>	1.8	2.2
294	Diabetes, age $\geq 36$	1.9	1.8
132	Atherosclerosis <sup>b</sup>	0.7	1.2 <sup>a</sup>
233	Other musculoskeletal and connective tissue operating room procedures <sup>b</sup>	3.8	18.8 <sup>a</sup>
467	Other factors influencing health status	0.6	1.4 <sup>a</sup>
470	Ungroupable	7.2	1.1 <sup>a</sup>
Total (All DRGs)		2.3	1.8

<sup>a</sup> Difference between two periods significant at 95 percent level.

<sup>b</sup> Age  $\geq 70$  and/or complications.



Table 4.24

PERCENTAGE OF FEMALE HOME HEALTH CARE USERS,  
NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	59.1	57.8
127	Heart failure and shock	63.6	62.9
209	Major joint and limb reattachment procedures	78.4	78.7
210	Hip and femur procedures except major joint <sup>a</sup>	78.7	81.4
89	Simple pneumonia and pleurisy <sup>a</sup>	51.9	51.1
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	66.3	68.7
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	72.5	73.8
320	Kidney and urinary tract infections <sup>a</sup>	59.6	62.7
148	Major large and small bowel procedures <sup>a</sup>	64.5	65.7
468	Unrelated operating room procedures	51.0	54.8
88	Chronic obstructive pulmonary disease	48.1	41.9
294	Diabetes, age $\geq 36$	70.0	70.5
140	Angina pectoris	71.1	71.1
243	Medical back problems	79.1	76.7
15	Transient ischemic attack and precerebral occlusions	68.7	65.2
138	Cardiac arrhythmia and conduction disorders <sup>a</sup>	65.8	65.2
96	Bronchitis and asthma <sup>a</sup>	62.6	63.7
87	Pulmonary edema and respiratory failure	54.3	58.3
121	Circulatory disorders with acute myocardial infarction and cardiovascular complications; discharged alive	60.6	N/A
174	Gastrointestinal hemorrhage <sup>a</sup>	62.6	62.9
239	Pathological fractures and musculoskeletal and connective tissue malignancy	71.2	67.8
82	Respiratory neoplasms	42.8	35.0
130	Peripheral vascular disorders <sup>a</sup>	64.1	61.8
Other DRGs That Were Important in 1981			
122	Circulatory disorders with acute myocardial infarction without cardiovascular complications; discharged alive	61.6	61.1
236	Fractures of hip and pelvis	83.1	80.8
12	Degenerative nervous system disorders	54.5	51.2
132	Atherosclerosis <sup>a</sup>	68.0	66.3
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	75.6	80.6
467	Other factors influencing health status	62.8	63.4
470	Ungroupable	48.0	68.6
Total (All DRGs)		62.5	62.8

<sup>a</sup>Age  $\geq 70$  and/or complications.

accounted for by women (Table 4.25), although the changes for DRGs 88 and 82 are somewhat less pronounced. DRG 15 (transient ischemic attack) shows a more pronounced increase in the fraction of visits accounted for by women (Table 4.25) than it does in the fraction of women patients (Table 4.24). Apparently, women in DRG 15 who used home health care were using more of it in the later period. We have not included a table similar to Table 4.25 showing the fraction of home health care days accounted for by women using the extended definition of an episode of care. The choice of definition makes very little difference in this regard.

Both men and women were more likely to use home health care (Tables 4.26 and 4.27), both overall and for all but one of the DRGs shown in the tables. (The exception was the same for both men and women: DRG 233, a DRG that showed unusual patterns—probably because of changes in coding—in other tables.)

## **HOSPITAL LENGTHS OF STAY FOR POSTHOSPITAL USERS AND NONUSERS**

Table 4.28 shows the average lengths of acute hospital stays for Medicare patients who used SNF care in the 1984/85 period and for those who did not. SNF users were “sicker” than nonusers in the sense that SNF users had dramatically longer lengths of stay than did nonusers, both overall and in all of the DRGs shown in the table. This, however, is not a change from 1981. (See Table 4.29.) As we noted in Sec. III, average acute-care lengths of stay declined more for SNF users than for nonusers. In 1981 SNF users overall had acute lengths of stay that were 2.2 times as long as the stays of nonusers. By 1984/85, this ratio had declined to 1.9. This pattern holds for all of the important DRGs for SNF care in 1984/85.

Tables 4.30 and 4.31 show similar figures for home health care users and nonusers. Exactly the same patterns hold for home health care as for SNF care. In 1981, home health care users had acute lengths of stay that were 1.7 times as long as those of nonusers. By 1984/85, this ratio had declined to 1.5. This same pattern holds for all the DRGs listed in the tables.

Table 4.25

PERCENTAGE OF HOME HEALTH VISITS USED BY FEMALES,  
NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	59.5	57.7
127	Heart failure and shock	65.7	65.0
209	Major joint and limb reattachment procedures	80.3	80.6
210	Hip and femur procedures except major joint <sup>a</sup>	78.5	81.7
89	Simple pneumonia and pleurisy <sup>a</sup>	52.6	50.5
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	65.7	70.0
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	72.5	73.0
320	Kidney and urinary tract infections <sup>a</sup>	58.1	59.1
148	Major large and small bowel procedures <sup>a</sup>	66.7	67.8
468	Unrelated operating room procedures	52.6	56.1
88	Chronic obstructive pulmonary disease	50.0	45.9
294	Diabetes, age $\geq 36$	70.3	71.1
140	Angina pectoris	71.8	73.2
243	Medical back problems	78.7	78.2
15	Transient ischemic attack and precerebral occlusions	68.5	63.3
138	Cardiac arrhythmia and conduction disorders <sup>a</sup>	65.7	66.3
96	Bronchitis and asthma <sup>a</sup>	63.1	65.2
87	Pulmonary edema and respiratory failure	55.8	59.1
121	Circulatory disorders with acute myocardial infarction and cardiovascular complications; discharged alive	62.3	N/A
174	Gastrointestinal hemorrhage <sup>a</sup>	62.7	62.1
239	Pathological fractures and musculoskeletal and connective tissue malignancy	71.5	71.8
82	Respiratory neoplasms	45.7	39.3
130	Peripheral vascular disorders <sup>a</sup>	64.6	63.5
Other DRGs That Were Important in 1981			
122	Circulatory disorders with acute myocardial infarction without cardiovascular complications; discharged alive	63.3	64.5
236	Fractures of hip and pelvis	82.1	79.9
12	Degenerative nervous system disorders	55.3	50.7
132	Atherosclerosis <sup>a</sup>	67.7	66.1
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	78.5	81.3
467	Other factors influencing health status	67.6	63.3
470	Ungroupable	44.4	69.8
Total (All DRGs)		63.6	64.0

<sup>a</sup>Age  $\geq 70$  and/or complications.

Table 4.26

PERCENTAGE OF FEMALE DISCHARGES USING HOME HEALTH CARE,  
NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	22.4	17.1 <sup>a</sup>
127	Heart failure and shock	20.0	13.5 <sup>a</sup>
209	Major joint and limb reattachment procedures	35.3	24.3 <sup>a</sup>
210	Hip and femur procedures except major joint <sup>b</sup>	32.0	21.7 <sup>a</sup>
89	Simple pneumonia and pleurisy <sup>b</sup>	12.4	7.6 <sup>a</sup>
296	Nutritional and miscellaneous metabolic disorders <sup>b</sup>	18.5	13.1 <sup>a</sup>
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>b</sup>	10.5	5.8 <sup>a</sup>
320	Kidney and urinary tract infections <sup>b</sup>	16.7	11.5 <sup>a</sup>
148	Major large and small bowel procedures <sup>b</sup>	23.9	19.2 <sup>a</sup>
468	Unrelated operating room procedures	18.0	11.7 <sup>a</sup>
88	Chronic obstructive pulmonary disease	19.1	12.3 <sup>a</sup>
294	Diabetes, age $\geq 36$	23.5	15.7 <sup>a</sup>
140	Angina pectoris	10.4	7.1 <sup>a</sup>
243	Medical back problems	14.4	8.3 <sup>a</sup>
15	Transient ischemic attack and precerebral occlusions	14.0	9.2 <sup>a</sup>
138	Cardiac arrhythmia and conduction disorders <sup>b</sup>	11.9	8.0 <sup>a</sup>
96	Bronchitis and asthma <sup>b</sup>	12.8	7.8 <sup>a</sup>
87	Pulmonary edema and respiratory failure	18.2	12.2 <sup>a</sup>
121	Circulatory disorders with acute myocardial infarction and cardiovascular complications; discharged alive	22.5	N/A
174	Gastrointestinal hemorrhage <sup>b</sup>	12.1	8.0 <sup>a</sup>
239	Pathological fractures and musculoskeletal and connective tissue malignancy	24.5	16.6 <sup>a</sup>
82	Respiratory neoplasms	18.3	13.2 <sup>a</sup>
130	Peripheral vascular disorders <sup>b</sup>	17.8	11.5 <sup>a</sup>
Other DRGs That Were Important in 1981			
122	Circulatory disorders with acute myocardial infarction without cardiovascular complications; discharged alive	14.6	11.5 <sup>a</sup>
236	Fractures of hip and pelvis	26.3	18.0 <sup>a</sup>
12	Degenerative nervous system disorders	22.1	16.2 <sup>a</sup>
132	Atherosclerosis <sup>b</sup>	12.8	10.3 <sup>a</sup>
233	Other musculoskeletal and connective tissue operating room procedures <sup>b</sup>	18.2	22.7 <sup>a</sup>
467	Other factors influencing health status	8.6	8.6
470	Ungroupable	12.8	9.3
Total (All DRGs)		15.2	9.8

<sup>b</sup>Age  $\geq 70$  and/or complications.

<sup>a</sup>Difference between two periods significant at 95 percent level.



Table 4.27

PERCENTAGE OF MALE DISCHARGES USING HOME HEALTH CARE,  
NONWAIVERED STATES

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	20.8	15.6 <sup>a</sup>
127	Heart failure and shock	14.9	9.9 <sup>a</sup>
209	Major joint and limb reattachment procedures	24.0	15.7 <sup>a</sup>
210	Hip and femur procedures except major joint <sup>b</sup>	29.9	18.9 <sup>a</sup>
89	Simple pneumonia and pleurisy <sup>b</sup>	11.8	7.7 <sup>a</sup>
296	Nutritional and miscellaneous metabolic disorders <sup>b</sup>	17.9	12.4 <sup>a</sup>
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>b</sup>	8.4	4.5 <sup>a</sup>
320	Kidney and urinary tract infections <sup>b</sup>	19.3	13.5 <sup>a</sup>
148	Major large and small bowel procedures <sup>b</sup>	19.2	15.2 <sup>a</sup>
468	Unrelated operating room procedures	15.4	9.7 <sup>a</sup>
88	Chronic obstructive pulmonary disease	14.1	9.0 <sup>a</sup>
294	Diabetes, age $\geq 36$	18.4	12.1 <sup>a</sup>
140	Angina pectoris	5.6	3.3 <sup>a</sup>
243	Medical back problems	8.0	5.1 <sup>a</sup>
15	Transient ischemic attack and precerebral occlusions	9.1	6.3 <sup>a</sup>
138	Cardiac arrhythmia and conduction disorders <sup>b</sup>	8.2	5.6 <sup>a</sup>
96	Bronchitis and asthma <sup>b</sup>	10.4	6.6 <sup>a</sup>
87	Pulmonary edema and respiratory failure	14.3	8.2 <sup>a</sup>
121	Circulatory disorders with acute myocardial infarction and cardiovascular complications; discharged alive	13.2	N/A
174	Gastrointestinal hemorrhage <sup>b</sup>	9.2	5.9 <sup>a</sup>
239	Pathological fractures and musculoskeletal and connective tissue malignancy	21.7	13.3 <sup>a</sup>
82	Respiratory neoplasms	13.8	10.1 <sup>a</sup>
130	Peripheral vascular disorders <sup>b</sup>	11.4	8.4 <sup>a</sup>
Other DRGs That Were Important in 1981			
122	Circulatory disorders with acute myocardial infarction without cardiovascular complications; discharged alive	7.1	5.8 <sup>a</sup>
236	Fractures of hip and pelvis	20.9	16.1 <sup>a</sup>
12	Degenerative nervous system disorders	21.6	16.3 <sup>a</sup>
132	Atherosclerosis <sup>b</sup>	7.6	6.4 <sup>a</sup>
233	Other musculoskeletal and connective tissue operating room procedures <sup>b</sup>	13.6	18.8 <sup>a</sup>
467	Other factors influencing health status	6.2	6.1
470	Ungroupable	15.7	6.0 <sup>a</sup>
Total (All DRGs)		11.1	7.0

<sup>b</sup>Age  $\geq 70$  and/or complications.

<sup>a</sup> Difference between two periods significant at 95 percent level.

Table 4.28

AVERAGE HOSPITAL LENGTH OF STAY, SNF CARE USERS,  
1984/85, NONWAIVERED STATES

DRG	Description	Used SNF Care?	
		Yes	No
14	Specific cerebrovascular disorders except transient ischemic attack	14.4	9.1
210	Hip and femur procedures except major joint <sup>a</sup>	14.3	14.2
209	Major joint and limb reattachment procedures	14.5	13.9
89	Simple pneumonia and pleurisy <sup>a</sup>	12.4	8.3
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	11.3	6.8
127	Heart failure and shock	13.0	7.5
468	Unrelated operating room procedures	23.8	13.2
236	Fractures of hip and pelvis	11.5	9.2
79	Respiratory infections and inflammations <sup>a</sup>	15.8	11.6
320	Kidney and urinary tract infections <sup>a</sup>	10.9	7.2
263	Skin grafts for skin ulcer or cellulitis, age $\geq 70$	20.1	18.9
148	Major large and small bowel procedures <sup>a</sup>	25.2	16.1
113	Amputation for circulatory disorders except upper limb and toe	17.8	16.1
416	Septicemia, age $\geq 18$	13.5	10.0
243	Medical back problems	10.4	6.9
239	Pathological fractures and musculoskeletal and connective tissue malignancy	11.6	9.2
271	Skin ulcers	13.3	10.6
1	Craniotomy age $\geq 18$ except for trauma	30.0	17.6
87	Pulmonary edema and respiratory failure	16.1	9.2
82	Respiratory neoplasms	13.1	8.5
253	Fractures, sprains, strains, and dislocation of upper arm, lower leg except foot <sup>a</sup>	9.3	6.2
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	11.0	5.4
174	Gastrointestinal hemorrhage <sup>a</sup>	10.8	6.5
Other DRGs That Were Important in 1981			
88	Chronic obstructive pulmonary disease	12.9	7.4
12	Degenerative nervous system disorders	12.7	8.4
130	Peripheral vascular disorders <sup>a</sup>	12.4	6.7
294	Diabetes, age $\geq 36$	12.4	7.3
132	Atherosclerosis <sup>a</sup>	10.6	5.8
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	16.7	9.3
467	Other factors influencing health status	7.4	3.6
470	Ungroupable	32.5	13.5
Total (All DRGs)		100.0	100.0

<sup>a</sup>Age  $\geq 70$  and/or complications.

Table 4.29  
AVERAGE HOSPITAL LENGTH OF STAY, SNF CARE USERS,  
1981, NONWAIVERED STATES  
(In days)

DRG	Description	Used SNF Care?	
		Yes	No
14	Specific cerebrovascular disorders except transient ischemic attack	21.8	13.0
210	Hip and femur procedures except major joint <sup>a</sup>	20.0	19.6
209	Major joint and limb reattachment procedures	20.3	18.3
89	Simple pneumonia and pleurisy <sup>a</sup>	18.2	10.6
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	17.3	9.5
127	Heart failure and shock	18.3	9.9
468	Unrelated operating room procedures	33.3	15.5
236	Fractures of hip and pelvis	19.1	15.0
79	Respiratory infections and inflammations <sup>a</sup>	23.4	14.6
320	Kidney and urinary tract infections <sup>a</sup>	15.3	8.8
263	Skin grafts for skin ulcer or cellulitis, age $\geq 70$	39.8	26.4
148	Major large and small bowel procedures <sup>a</sup>	29.7	19.0
113	Amputation for circulatory disorders except upper limb and toe	29.1	25.3
416	Septicemia, age $\geq 18$	18.6	12.9
243	Medical back problems	17.1	9.3
239	Pathological fractures and musculoskeletal and connective tissue malignancy	20.3	12.2
271	Skin ulcers	24.3	15.9
1	Craniotomy, age $\geq 18$ except for trauma	40.2	22.4
87	Pulmonary edema and respiratory failure	20.6	11.0
82	Respiratory neoplasms	20.3	11.0
253	Fractures, sprains, strains and dislocation of upper arm, lower leg except foot <sup>a</sup>	15.2	8.8
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	18.3	6.9
174	Gastrointestinal hemorrhage <sup>a</sup>	16.7	8.5
Other DRGs That Were Important in 1981			
88	Chronic obstructive pulmonary disease	20.3	9.6
12	Degenerative nervous system disorders	19.8	12.6
130	Peripheral vascular disorders <sup>a</sup>	20.3	9.8
294	Diabetes, age $\geq 36$	18.6	9.4
132	Atherosclerosis <sup>a</sup>	18.7	8.7
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	19.5	15.1
467	Other factors influencing health status	19.7	9.0
470	Ungroupable	21.9	9.8
Total (All DRGs)		14.8	7.6

<sup>a</sup>Age  $\geq 70$  and/or complications.

Table 4.30

AVERAGE HOSPITAL LENGTH OF STAY, HOME HEALTH CARE USERS,  
1984/85, NONWAIVERED STATES  
(In days)

DRG	Description	Used SNF Care?	
		Yes	No
14	Specific cerebrovascular disorders except transient ischemic attack	11.3	9.4
127	Heart failure and shock	9.4	7.2
209	Major joint and limb reattachment procedures	14.9	13.5
210	Hip and femur procedures except major joint <sup>a</sup>	15.0	13.8
89	Simple pneumonia and pleurisy <sup>a</sup>	10.7	8.1
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	8.3	6.8
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders <sup>a</sup>	7.6	5.3
320	Kidney and urinary tract infections <sup>a</sup>	8.5	7.1
148	Major large and small bowel procedures <sup>a</sup>	19.8	15.5
468	Unrelated operating room procedures	18.3	12.8
88	Chronic obstructive pulmonary disease	9.4	7.2
294	Diabetes, age $\geq 36$	8.8	7.0
140	Angina pectoris	6.7	4.8
243	Medical back problems	9.3	6.6
15	Transient ischemic attack and precerebral occlusions	7.1	4.9
138	Cardiac arrhythmia and conduction disorders <sup>a</sup>	7.8	5.3
96	Bronchitis and asthma <sup>a</sup>	8.5	6.4
87	Pulmonary edema and respiratory failure	12.3	8.8
121	Circulatory disorders with acute myocardial infarction and cardiovascular complications; discharged alive	14.1	10.8
174	Gastrointestinal hemorrhage <sup>a</sup>	8.9	6.3
239	Pathological fractures and musculoskeletal and connective tissue malignancy	10.7	8.9
82	Respiratory neoplasms	10.7	8.3
130	Peripheral vascular disorders <sup>a</sup>	10.0	6.3
Other DRGs That Were Important in 1981			
122	Circulatory disorders with acute myocardial infarction without cardiovascular complications; discharged alive	11.5	8.7
236	Fractures of hip and pelvis	11.1	9.0
12	Degenerative nervous system disorders	10.3	8.1
132	Atherosclerosis <sup>a</sup>	8.0	5.7
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	13.8	8.9
467	Other factors influencing health status	6.1	3.4
470	Ungroupable	19.7	13.9
Total (All DRGs)		11.3	7.3

<sup>a</sup>Age  $\geq 70$  and/or complications.



Table 4.31

AVERAGE HOSPITAL LENGTH OF STAY, HOME HEALTH CARE USERS,  
1981, NONWAIVERED STATES  
(In days)

DRG	Description	Used SNF Care?	
		Yes	No
14	Specific cerebrovascular disorders except transient ischemic attack	18.7	13.2
127	Heart failure and shock	13.1	9.6
209	Major joint and limb reattachment procedures	20.8	17.9
210	Hip and femur procedures except major joint <sup>a</sup>	21.9	19.1
89	Simple pneumonia and pleurisy <sup>a</sup>	14.8	10.5
296	Nutritional and miscellaneous metabolic disorders <sup>a</sup>	12.1	9.5
182	Esophagitis, gastroenteritis and miscellaneous digestive disorders <sup>a</sup>	11.1	6.8
320	Kidney and urinary tract infections <sup>a</sup>	11.7	8.6
148	Major large and small bowel procedures <sup>a</sup>	24.3	18.4
468	Unrelated operating room procedures	26.0	15.0
88	Chronic obstructive pulmonary disease	13.7	9.3
294	Diabetes, age $\geq 36$	12.8	9.1
140	Angina pectoris	10.2	6.5
243	Medical back problems	13.8	9.1
15	Transient ischemic attack and precerebral occlusions	10.8	6.8
138	Cardiac arrhythmia and conduction disorders <sup>a</sup>	11.7	7.1
96	Bronchitis and asthma <sup>a</sup>	11.7	8.1
87	Pulmonary edema and respiratory failure	16.2	10.6
121	Circulatory disorders with acute myocardial infarction and cardiovascular complications; discharged alive	N/A	N/A
174	Gastrointestinal hemorrhage <sup>a</sup>	13.3	8.4
239	Pathological fractures and musculoskeletal and connective tissue malignancy	15.9	11.9
82	Respiratory neoplasms	14.8	10.8
130	Peripheral vascular disorders <sup>a</sup>	16.1	9.5
Other DRGs That Were Important in 1981			
122	Circulatory disorders with acute myocardial infarction without cardiovascular complications; discharged alive	17.3	11.9
236	Fractures of hip and pelvis	19.2	14.9
12	Degenerative nervous system disorders	17.5	12.3
132	Atherosclerosis <sup>a</sup>	13.0	8.5
233	Other musculoskeletal and connective tissue operating room procedures <sup>a</sup>	20.3	15.0
467	Other factors influencing health status	15.7	8.7
470	Ungroupable	16.0	9.5
Total (All DRGs)		15.8	9.3

<sup>a</sup>Age  $\geq 70$  and/or complications.

## MEDICAL VERSUS SURGICAL DRGS

Tables 4.32 and 4.33 provide aggregate statistics on use of and charges for hospital, SNF, and home health care similar to those shown in Table 3.1. The difference here is that the figures in Table 4.32 reflect care provided to Medicare patients discharged from acute-care hospitals in medical DRGs, whereas those in Table 4.33 are for patients in surgical DRGs. Excluded from both tables are patients in "other DRGs"—substance abuse and neonatal DRGs as well as the catch-all DRGs, DRG 468 (unrelated operating room procedure) and DRG 470 (ungroupable).

Table 4.32

### POSTHOSPITAL CARE: MEDICAL DRGS, MAXIMALIST DEFINITION OF EPISODE OF CARE, NONWAIVERED STATES

Item	Discharges in	
	1981	1984/85
Hospital Care		
Total Medicare discharges from short-stay hospitals	1,228,528	1,209,345
Average covered charges per discharge	\$2,923	\$3,762
Average length of stay	9.3 days	7.0 days
Average covered charges per day	\$314	\$537
SNF Care		
Number of users	27,650	32,900
Percentage of discharges using SNF care	2.3%	2.7%
Average covered charges per user	\$2,263	\$2,747
Average covered charges per hospital discharge	\$51	\$75
Average covered days per user	28.7 days	24.3 days
Average covered charges per covered day	\$79	\$113
Home Health Care		
Number of users	105,628	160,201
Percentage of discharges using home health care	8.6%	13.2%
Average covered charges per user	\$492	\$725
Average covered charges per hospital discharge	\$42	\$96
Average visits per user	12.5	13.6
Average covered charges per visit	\$40	\$53

Table 4.33

## POSTHOSPITAL CARE: SURGICAL DRGS, MAXIMALIST DEFINITION OF EPISODE OF CARE, NONWAIVERED STATES

Item	Discharges in	
	1981	1984/85
Hospital Care		
Total Medicare discharges from short-stay hospitals	332,434	451,983
Average covered charges per discharge	\$4,803	\$7,698
Average length of stay	10.9 days	9.7 days
Average covered charges per day	\$439	\$793
SNF Care		
Number of users	11,489	19,212
Percentage of discharges using SNF care	3.5%	4.3%
Average covered charges per user	\$2,540	\$3,079
Average covered charges per hospital discharge	\$88	\$131
Average covered days per user	31.5 days	26.5 days
Average covered charges per covered day	\$81	\$116
Home Health Care		
Number of users	27,574	60,969
Percentage of discharges using home health care	8.3%	13.5%
Average covered charges per user	\$564	\$835
Average covered charges per hospital discharge	\$47	\$113
Average visits per user	14.1	15.4
Average covered charges per visit	\$40	\$54

Tables 4.32 and 4.33 show some generally unsurprising differences in average charges and care patterns for Medicare patients in medical and surgical DRGs. For acute inpatient care, patients in surgical DRGs had higher average covered charges, longer lengths of stay, and higher average per-day charges than did patients in medical DRGs. These patterns are apparent in both the pre- and the post-PPS periods.

Regarding SNF care, surgical patients were more likely to use SNF care than were medical patients, stayed longer in an SNF than medical patients once they got there, and had higher total covered charges per

actual user of SNF care than did medical patients. These patterns, too, hold for both the pre- and post-PPS periods. Covered charges per day of SNF care were only slightly higher (about 2.5 percent for both the pre- and post-PPS periods) for surgical patients than for medical patients.

The picture is only slightly different for home health care. Surgical patients were a little *less* likely to use home health care than were medical patients during the pre-PPS period but a bit *more* likely to do so after implementation of the PPS. Otherwise, the patterns for home health care are the same as for SNF care. Surgical patients had more home health visits and higher total covered charges for home health care than did medical patients, but per-visit charges were nearly identical for the two groups.

Table 4.34 shows percentage changes from 1981 to 1984/85 in the indicators of costs and utilization for medical and surgical DRGs. The general message of these figures is that patients in medical and surgical DRGs do not seem to have been affected differently by the PPS. The likelihood that surgical patients would use SNF care grew slightly more than the likelihood that medical patients would, but growth in total covered charges and per-day covered charges for SNF care were similar for both classes of patients. Declines in average SNF length of stay was also similar. These same patterns hold for home health care, with the exception that both groups experienced similar *increases* in the average number of home health visits.

## **HOSPITAL READMISSION RATES AND MORTALITY RATES AMONG SNF PATIENTS**

Finally, we return to hospital readmission rates and mortality rates among Medicare SNF patients. We noted in Sec. III, that, overall, both rates had declined from the pre- to the post-PPS period: SNF patients are less likely to be transferred from SNFs back to hospitals and they are less likely to die while in SNFs. Table 4.35 demonstrates that, although SNF readmission rates have declined overall, some DRGs that are important in accounting for Medicare SNF care have shown the reverse trend. Ten of the 23 DRGs listed in Table 4.35 showed increased readmission rates in the post-PPS period. Table 4.36 confirms, however, that the overall decline in death rates among Medicare SNF patients has been reflected in individual DRGs. Among the 23 DRGs listed in Table 4.36, only two showed higher death rates in the post-PPS period.



Table 4.34

PERCENTAGE CHANGES IN POSTHOSPITAL CARE, MEDICAL AND SURGICAL DRGS, FROM 1981 TO 1984/85: MAXIMALIST DEFINITION OF EPISODE OF CARE, NONWAIVERED STATES

Item	Medical DRGs	Surgical DRGs
Hospital Care		
Total Medicare discharges from short-stay hospitals	-1.6%	36.0%
Average hospital covered charges per discharge	28.7	60.3
Average hospital length of stay	-24.7	-11.0
Average covered charges per day	71.0	80.6
SNF Care		
Number of users	11.9	67.2
Percentage of discharges using SNF care	17.4	22.9
Average covered charges per user	21.4	21.2
Average covered charges per hospital discharge	47.1	48.9
Average covered days per user	-15.3	-15.9
Average covered charges per covered day	43.0	43.2
Home Health Care		
Number of users	51.7	121.1
Percentage of discharges using home health care	53.5	62.7
Average covered charges per user	47.4	48.0
Average covered charges per hospital discharge	128.6	140.4
Average visits per user	8.8	9.2
Average covered charges per visit	32.5	35.0

Table 4.35

PERCENTAGE OF SNF PATIENTS TRANSFERRED TO  
ACUTE-CARE HOSPITALS<sup>a</sup>

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	22.0	22.8
210	Hip and femur procedures except major joint, age $\geq 70$ and/or complications	12.5	13.1
209	Major joint and limb reattachment procedures	11.8	12.3
89	Simple pneumonia and pleurisy, age $\geq 70$ and/or complications	28.4	27.3
296	Nutritional and miscellaneous metabolic disorders, age $\geq 70$ and/or complications	23.1	31.5
127	Heart failure and shock	23.4	27.1
468	Unrelated operating room procedures	26.1	24.2
236	Fractures of hip and pelvis	12.0	14.8
79	Respiratory infections and inflammations, age $\geq 70$ and/or complications	28.5	31.6
320	Kidney and urinary tract infections, age $\geq 70$ and/or complications	25.4	23.4
263	Skin grafts for skin ulcer or cellulitis, age $\geq 70$	31.2	26.8
148	Major large and small bowel procedures, age $\geq 70$ and/or complications	23.6	17.4
113	Amputation for circulatory disorders except upper limb and toe	29.2	23.6
416	Septicemia age $\geq 18$	29.4	36.2
243	Medical back problems	8.3	10.7
239	Pathological fractures and musculoskeletal and connective tissue malignancy	10.3	25.0
271	Skin ulcers	30.5	28.8
1	Craniotomy age $\geq 18$ except for trauma	25.0	15.6
87	Pulmonary edema and respiratory failure	28.3	26.7
82	Respiratory neoplasms	22.6	35.9
253	Fractures, sprains, strains, and dislocation of upper arm, lower leg except foot, age $\geq 70$ and/or complications	11.2	14.8
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders, age $\geq 70$ and/or complications	25.1	20.0
174	Gastrointestinal hemorrhage, age $\geq 70$ , and/or complications	19.4	28.0
Total (All DRGs)		20.0	21.5

<sup>a</sup>Fraction of patients admitted to an acute-care hospital on the same day as or on the day following discharge from an SNF.

<sup>b</sup>Difference between two periods significant at 95 percent level.

Table 4.36

## MORTALITY RATES AMONG SNF PATIENTS

DRG	Description	1984/85	1981
14	Specific cerebrovascular disorders except transient ischemic attack	17.6	21.6 <sup>a</sup>
210	Hip and femur procedures except major joint, age $\geq 70$ and/or complications	4.5	7.8
209	Major joint and limb reattachment procedures	3.0	5.9
89	Simple pneumonia and pleurisy, age $\geq 70$ and/or complications	22.5	32.8
296	Nutritional and miscellaneous metabolic disorders, age $\geq 70$ and/or complications	24.1	31.5
127	Heart failure and shock	23.6	34.7
468	Unrelated operating room procedures	17.7	13.3
236	Fractures of hip and pelvis	4.5	11.7
79	Respiratory infections and inflammations, age $\geq 70$ and/or complications	29.1	35.6
320	Kidney and urinary tract infections, age $\geq 70$ and/or complications	17.4	33.0
263	Skin grafts for skin ulcer or cellulitis, age $\geq 70$	13.5	16.3
148	Major large and small bowel procedures, age $\geq 70$ and/or complications	11.8	21.0
113	Amputation for circulatory disorders except upper limb and toe	13.0	16.7
416	Septicemia age $\geq 18$	24.2	38.2
243	Medical back problems	5.9	12.5
239	Pathological fractures and musculoskeletal and connective tissue malignancy	20.9	37.1
271	Skin ulcers	16.4	28.2
1	Craniotomy age $\geq 18$ except for trauma	15.9	23.8
87	Pulmonary edema and respiratory failure	23.3	21.1
82	Respiratory neoplasms	51.3	59.9
253	Fractures, sprains, strains and dislocation of upper arm, lower leg except foot, age $\geq 70$ and/or complications	4.0	10.1
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders, age $\geq 70$ and/or complications	23.3	25.9
174	Gastrointestinal hemorrhage, age $\geq 70$ , and/or complications	22.6	32.8
Total (All DRGs)		15.8	22.1

<sup>a</sup>Difference between two periods significant at 95 percent level.

## V. STATE-TO-STATE VARIATIONS IN POSTHOSPITAL CARE

There is considerable variation from one state to another in the fraction of Medicare patients who use posthospital care, how much of this care they use, and how much it costs. This variation is of interest principally because it poses a puzzle. Why do patterns and costs of care vary so much from one state to another? Is care in some states better or more efficient than in others? If so, what policies will encourage care in all states to converge on these better or more efficient patterns?

State-to-state variation is interesting also because it constitutes a crude natural experiment on the relationship between types of posthospital care and between hospital and posthospital care. We may ask, for example, whether SNF and home health care appear to be substitutes for each other: Do states with relatively heavy use of SNF care have relatively light use of home health care? Similarly, we can search for evidence that incentives to discharge patients more quickly from acute-care hospitals have resulted in greater use of posthospital services: Are the states with the most dramatic declines in hospital lengths of stay the same states that show the largest increases in the use of, the extent of, or charges for posthospital care?

Unfortunately, we cannot yet explain the variations in posthospital care patterns. Research on this subject is under way. In this section, we must restrict ourselves to documenting this variation and noting some factors that seem *not* to cause it. We also report on the conclusions that can be drawn from the natural experiment that this variation provides.

### PROPENSITY TO USE POSTHOSPITAL CARE

Table 5.1 shows the fraction of Medicare patients discharged from acute-care hospitals who subsequently used SNF or home health care, in the pre-PPS period (1981) and in the post-PPS period (1984/85). These figures show striking variations in the propensity of Medicare patients in different states to use posthospital care, and there is no indication that the variation declined from 1981 to 1984/85. If anything, it has increased. In 1981, the fraction of Medicare patients using SNF care ranged from 0.1 percent in Mississippi to 4.6 percent in



Table 5.1

PERCENTAGE OF PATIENTS USING POSTHOSPITAL CARE,  
BY STATE

State	SNF Care		Home Health Care	
	1981	1984/85	1981	1984/85
Alabama	2.9	4.1	7.5	12.0
Alaska	0.4	0.7 <sup>a</sup>	3.4	3.8 <sup>a</sup>
Arizona	2.4	2.4 <sup>a</sup>	3.3	7.1
Arkansas	0.3	1.6	4.9	8.8
California	4.4	6.2	10.4	15.6
Colorado	1.3	3.2	10.1	14.9
Connecticut	3.5	4.0	18.9	23.8
Delaware	1.9	2.8	11.1	18.0
District of Columbia	1.1	1.0 <sup>a</sup>	11.0	14.2
Florida	3.4	3.7	12.8	16.1
Georgia	1.5	1.5 <sup>a</sup>	5.7	9.2
Hawaii	4.6	3.2	8.7	10.8
Idaho	4.0	5.4	8.9	14.5
Illinois	3.5	3.7	8.5	13.3
Indiana	2.8	4.2	4.9	8.7
Iowa	2.1	3.7	6.4	8.6
Kansas	0.7	1.7	4.4	9.7
Kentucky	3.1	2.3	5.1	5.6
Louisiana	0.8	2.2	7.6	12.5
Maine	1.5	1.3 <sup>a</sup>	10.7	12.0
Maryland <sup>b</sup>	2.2	1.2	10.4	13.2
Massachusetts <sup>b</sup>	1.2	1.0	15.9	18.4
Michigan	3.5	3.8	8.7	14.6
Minnesota	1.0	2.2	5.6	8.8
Mississippi	0.1	0.1 <sup>a</sup>	10.3	18.1
Missouri	1.6	3.3	9.3	15.2
Montana	3.2	4.5	5.5	9.5
Nebraska	1.7	3.1	5.4	8.6
Nevada	2.1	3.2	4.7	10.5
New Hampshire	4.1	2.3	14.7	18.7
New Jersey <sup>b</sup>	2.4	1.6	15.5	17.9
New Mexico	0.8	1.6	11.7	14.4
New York <sup>b</sup>	2.3	2.3 <sup>a</sup>	11.8	14.5
North Carolina	1.6	2.0	5.5	10.5
North Dakota	3.7	3.5 <sup>a</sup>	4.5	6.7
Ohio	3.8	2.7	7.9	10.6
Oklahoma	1.5	1.3 <sup>a</sup>	4.2	10.9
Oregon	3.3	3.1 <sup>a</sup>	9.0	13.6
Pennsylvania	3.2	4.3	15.3	21.5
Rhode Island	4.3	3.3	15.2	19.0
South Carolina	2.1	2.1 <sup>a</sup>	8.4	13.8
South Dakota	1.0	0.7 <sup>a</sup>	4.3	6.4

Table 5.1 (continued)

State	SNF Care		Home Health Care	
	1981	1984/85	1981	1984/85
Tennessee	1.5	2.4	6.7	14.6
Texas	0.5	1.0	5.6	12.6
Utah	4.0	7.2	5.0	11.0
Vermont	1.8	1.3 <sup>a</sup>	17.4	20.8
Virginia	1.4	1.7	4.4	8.7
Washington	4.0	4.1 <sup>a</sup>	10.0	13.6
West Virginia	1.0	1.3	6.6	9.2
Wisconsin	1.1	3.1	7.8	12.6
Wyoming	0.2	0.7	5.0	9.3
All states	2.4	2.9	9.1	13.7

<sup>a</sup>Difference between two periods *not* significant at 95 percent level.

<sup>b</sup>Waivered states.

Hawaii. By 1984/85, this spread had widened to 0.1 percent in Mississippi to 7.2 percent in Utah. For home health care, the picture is a bit less clear. In 1981, the fraction of patients using home health care ranged from 3.3 percent in Arizona to 18.9 percent in Connecticut. In 1984/85, the state with the least use of home health care was Alaska (3.8 percent)—a state in which home health care is unusually problematic. Excluding Alaska, the fraction of patients using home health care in the post-PPS period ranges from 5.6 percent in Kentucky to 23.8 percent in Connecticut. The unweighted variances across states of propensities to use both types of care also increased.

The table also shows that the national trend toward more use of SNF care was not characteristic of all states. The fraction of Medicare patients using SNF care rose in 31 of the states that did not have waivers from the PPS, fell in 15 states, and stayed the same in five states. (In each of the four waived states, SNF use was steady or declined.) The pattern of change from the pre- to post-PPS periods is more uniform for home health care. In every state (both waived and nonwaived), the fraction of patients using home health care increased.

Not surprisingly, states with a high propensity to use SNF care in 1981 also had a high propensity to use SNF care in 1984/85. This pattern is even more pronounced for home health care.<sup>1</sup>

<sup>1</sup>An unweighted regression of SNF propensity in 1984/85 on SNF propensity in 1981 in nonwaivered states yields a correlation coefficient of 0.78. The equivalent coefficient

More interestingly, there seems to be no relationship between the use of SNF care in a state and the use of home health care in the same state; there is no indication that home health care either substitutes for or complements SNF care. Neither does there appear to be any relationship between changes in the use of SNF care and changes in the use of home health care. Figure 5.1 presents a rather busy picture of propensities to use SNF and home health care and how these propensities have changed. The shaded points show propensities to use the two types of care in 1984/85; and the unshaded points are for 1981. Lines connect the two points for each state. There is no apparent pattern in either points or lines.

## SNF LENGTH OF STAY AND HOME HEALTH VISITS

Table 5.2 shows average covered days of SNF care for those patients who used SNF care and average number of home health visits for those who used home health care, by state, in 1981 and in 1984/85. (We have calculated number of home health visits using our maximalist definition.) Here also we see some exceptions to the overall patterns described in earlier sections of this report. In 47 states (including three-waivered states), SNF length of stay declined, but in four states (including one with a waiver) SNF length of stay increased. For home health care, the pattern is more varied: 40 states (including three waivered states) showed increased numbers of visits, and 11 (including one waivered state) showed decreases.

The table also shows considerable variation in length of stay and number of visits. Average lengths of SNF stay in 1984/85 range from 15.5 days in Oklahoma to 39.8 days in Delaware. Home health visits range from 8.4 in Nebraska to 19.4 in Delaware. States with relatively long SNF stays in 1981 also had long lengths of stay in 1984/85.<sup>2</sup> Similarly, states characterized by large numbers of home health visits in the pre-PPS period generally had large numbers of visits in the post-PPS period.<sup>3</sup>

State-to-state variations in the propensity to use SNF care might reflect the differing availability of such care in different states. If this were so, one might further hypothesize that only those patients most desperately in need of SNF care would actually get it. If these patients

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for home health care is 0.92. If the correlations are weighted by the number of Medicare hospital discharges in each state, the coefficients are 0.83 for SNF use and 0.91 for home health care use.

<sup>2</sup>Correlation coefficients: 0.57 unweighted and 0.78 weighted.

<sup>3</sup>Correlation coefficients: 0.72 unweighted and 0.88 weighted.

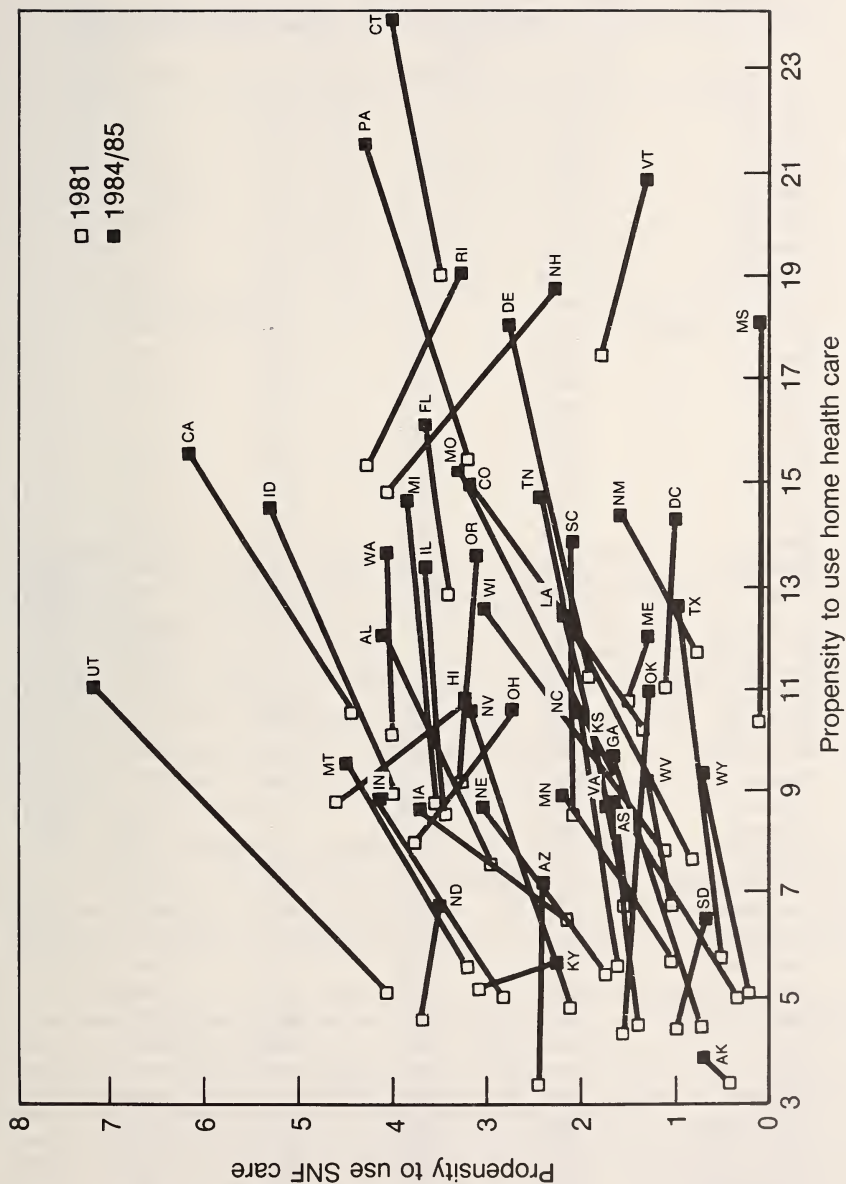


Fig. 5.1—Propensities to use SNF and home health care, 1981 and 1984/85



Table 5.2

SNF LENGTH OF STAY AND NUMBER OF HOME HEALTH VISITS,  
BY STATE

State	SNF Care (days)		Home Health Care (Visits)	
	1981	1984/85	1981	1984/85
Alabama	22.8	18.4	12.7	14.2
Alaska	48.3	17.4	15.0	12.6
Arizona	23.2	21.3	9.1	12.3
Arkansas	23.7	17.0	11.3	11.8
California	20.2	20.9	12.8	13.3
Colorado	17.9	15.6	14.3	13.8
Connecticut	23.6	24.5	17.5	17.6
Delaware	41.9	39.8	16.3	19.4
District of Columbia	35.5	29.1	12.6	13.9
Florida	31.5	29.1	17.8	18.8
Georgia	22.6	20.9	12.9	15.6
Hawaii	40.4	36.1	9.9	11.3
Idaho	18.8	18.3	10.2	14.1
Illinois	30.2	24.6	13.6	13.4
Indiana	30.7	26.8	10.0	11.3
Iowa	23.3	16.2	10.0	9.8
Kansas	28.7	22.6	12.0	11.6
Kentucky	39.4	25.6	8.2	9.7
Louisiana	30.8	17.8	15.9	16.5
Maine	32.4	24.5	10.9	11.5
Maryland <sup>a</sup>	34.1	27.1	13.1	13.6
Massachusetts <sup>a</sup>	34.0	28.4	15.1	15.3
Michigan	32.4	29.3	11.2	13.5
Minnesota	23.4	19.2	11.3	10.3
Mississippi	29.8	20.4	14.2	17.3
Missouri	30.9	25.8	11.9	13.4
Montana	28.1	21.1	8.9	10.5
Nebraska	27.9	25.7	8.7	8.4
Nevada	21.9	24.6	13.4	14.9
New Hampshire	31.0	28.6	12.0	10.5
New Jersey <sup>a</sup>	35.5	32.2	17.7	15.4
New Mexico	43.9	16.6	11.0	12.4
New York <sup>a</sup>	29.2	31.8	13.7	15.3
North Carolina	36.1	33.3	10.3	12.4
North Dakota	29.9	25.7	13.8	11.3
Ohio	34.9	23.2	9.6	9.8
Oklahoma	20.7	15.5	10.7	11.9
Oregon	34.1	24.4	11.7	13.2
Pennsylvania	36.1	32.1	12.1	14.6
Rhode Island	31.1	29.6	15.7	16.3
South Carolina	45.0	36.8	10.4	12.8
South Dakota	26.0	20.3	7.7	9.0

Table 5.2 (continued)

State	SNF Care (days)		Home Health Care (Visits)	
	1981	1984/85	1981	1984/85
Tennessee	40.7	33.6	13.6	17.4
Texas	28.6	25.8	13.7	15.5
Utah	24.5	21.0	12.8	16.6
Vermont	34.3	31.6	12.3	11.1
Virginia	41.2	31.4	11.6	14.8
Washington	19.0	18.9	11.7	12.6
West Virginia	41.3	33.9	8.4	10.6
Wisconsin	32.8	27.1	11.1	12.4
Wyoming	49.5	23.5	9.7	13.9
All states	29.8	25.7	13.3	14.3

<sup>a</sup>Waivered states.

tended to have longer lengths of stay once admitted to an SNF, we might expect to find a negative relationship between propensity to use SNF care and SNF length of stay. This is not the case, however. There appears to be no relation between SNF length of stay and propensity to use SNF care. These data therefore suggest that at least one of the above hypotheses is incorrect. Either SNF availability is not the principal cause of state-to-state variation, or SNF care is not routinely reserved for the patients who require (or at least get) the largest amount of it.<sup>4</sup>

For home health care, there is a fairly clear positive relationship in both 1981 and 1984/85 between propensity to use care and average number of visits.<sup>5</sup> (See Fig. 5.2 for a plot of propensities and average numbers of visits for 1984/85.) Thus, it does not appear that home

<sup>4</sup>Although our data do not shed light on which of these hypotheses is incorrect, it seems more likely that it is the second. SNF occupancy rates are nearly universally high, and stories about how difficult it is to place Medicare patients in SNFs abound. It is hard to believe that SNF availability is not a major cause of state-to-state variation in SNF utilization. Moreover, since SNF occupancy rates are so high, individual SNFs may exercise some discretion over who is admitted. A patient requiring a relatively long stay may not be a particularly attractive patient from the SNF's point of view. After the twentieth day of care, the SNF must collect a copayment from the patient. Life might be simpler all around if the SNF dealt with relatively short-stay patients, collecting most of its revenue directly from Medicare.

<sup>5</sup>Both the weighted and unweighted correlation coefficients are 0.53 in 1984/85.

health care is generally reserved for the patients who need the largest amount of it. Rather, it appears that in states where practice patterns produced frequent home health care use, they also produced relatively extensive use. This same positive relationship between propensity to use and number of visits is apparent if we consider percentage changes from 1981 to 1984/85 in both variables.

Finally, there is no apparent relationship between SNF length of stay and number of home health visits. Neither are the percentage changes in these two variables from the pre- to the post-PPS periods related. Thus, it would seem that the factors influencing SNF length of stay are different from the ones influencing number of home health visits. That is to say that availability of SNF and home health services, state licensing requirements for SNFs and home health agencies, and other factors specific to one or the other kind of care seem to be more important than factors that might affect both, such as efforts by hospitals to discharge patients "quicker and sicker."

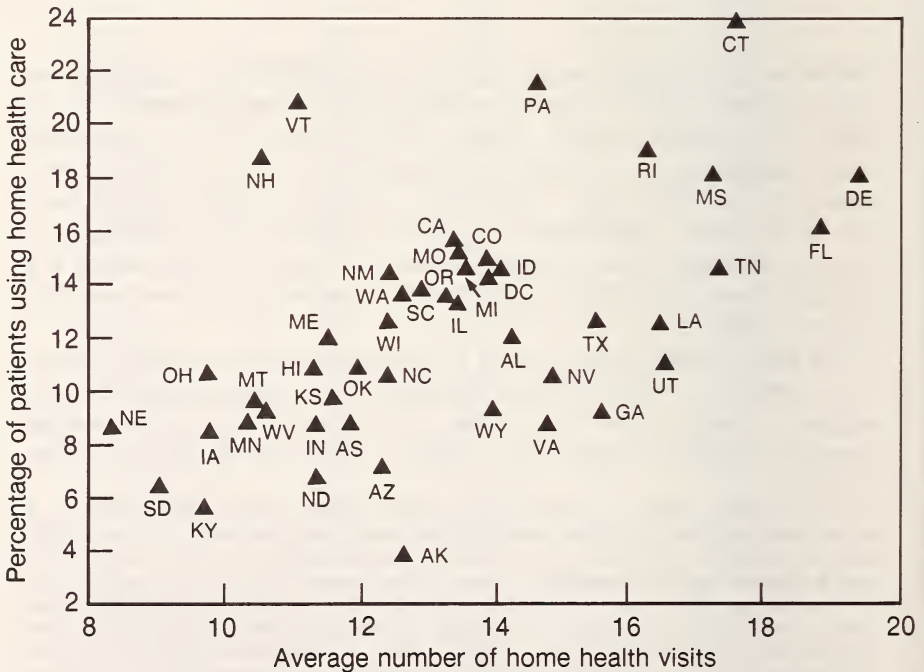


Fig. 5.2—Home health visits and home health care propensities, 1984/85

## COVERED CHARGES

Table 5.3 shows covered charges per day of SNF care and per home health visit, by state, in 1981 and in 1984/85. Not surprisingly, covered charges per unit of care rose in every case. As with the other statistics we have noted so far, the variation in charges per unit of care is considerable from one state to another. In 1984/85, average charges per day of SNF care ranged from \$62.75 in South Carolina to \$239.03 in Louisiana. Covered charges per home health visit ranged from \$32.15 in Vermont to \$68.18 in California (excluding Alaska's average of \$89.68 per visit). Percentage increases in covered charges per unit of service also varied widely. Covered charges per day of SNF care rose 7 percent in New York and 96 percent in Arkansas between 1981 and 1984/85. Percentage increases in home health visit costs ranged from 2 percent in Idaho to 84 percent in Utah (again ignoring Alaska).

The states with the largest percentage increases in per-visit home health charges were rural, sparsely populated states. (Eight states saw increases of more than 50 percent: Alaska, Utah, North Dakota, South Dakota, Kansas, Wyoming, Nebraska, and Iowa.) Expanding home health service in such states is likely to require providing care to patients in remote areas, and it is perhaps not surprising that the cost of an average visit rose rapidly in these states. In contrast, there is no apparent common geographic or demographic characteristic shared by states with relatively large increases in per-day SNF costs.

Not surprisingly, states with relatively high per-unit charges in 1981 also had high per-unit charges in 1984/85. In 1984/85, states with relatively high daily SNF charges also had relatively high per-visit home health charges. (An unweighted regression on a sample of all nonwaivered states yields a correlation coefficient of 0.53.) Interestingly, this relationship is much less marked for 1981 (correlation coefficient 0.20).

In 1984/85, per-day SNF charges are negatively associated with SNF length of stay: States with high per-day SNF charges seem to have shorter stays. (An unweighted regression gives a correlation coefficient of -0.47.) This may be some indication of price sensitivity on the part of SNF users, but one should probably not make too much of this. No such relationship is apparent in the 1981 data.

There does not seem to be any relationship between the level of per-day SNF charges and propensity to use SNF care. There is, however, a weak positive relationship (correlation coefficient 0.43) between the percentage change in per-day SNF charges and the percentage change in the propensity to use SNF care. It appears that per-day charges rose more rapidly in states that had greater increases in use.



Table 5.3  
COVERED CHARGES PER UNIT OF CARE,  
BY STATE  
(In dollars)

State	Per Day of SNF Care		Per Home Health Care	
	1981	1984/85	1981	1984/85
Alabama	45.18	76.05	37.29	48.48
Alaska	129.57	214.67	39.29	89.68
Arizona	80.36	125.51	49.61	65.02
Arkansas	76.27	149.59	41.41	55.37
California	106.45	142.75	51.23	68.18
Colorado	82.68	124.80	38.95	55.49
Connecticut	58.52	87.34	27.94	38.58
Delaware	55.43	73.16	25.47	36.45
District of Columbia	74.81	121.61	36.88	53.88
Florida	69.95	101.10	40.35	51.45
Georgia	78.96	112.40	48.99	59.36
Hawaii	103.28	103.30	50.02	67.68
Idaho	51.89	77.18	43.86	44.58
Illinois	93.60	122.96	44.81	57.02
Indiana	68.80	94.96	30.55	43.86
Iowa	93.76	165.54	21.69	33.22
Kansas	80.22	104.54	29.01	45.43
Kentucky	68.04	100.84	38.83	47.32
Louisiana	125.36	239.03	39.89	57.78
Maine	111.33	154.72	31.09	40.54
Maryland <sup>a</sup>	64.34	96.06	42.54	53.51
Massachusetts <sup>a</sup>	133.04	150.66	26.52	36.32
Michigan	69.33	92.13	46.48	58.82
Minnesota	106.94	130.14	34.83	49.30
Mississippi	59.40	82.41	42.39	51.23
Missouri	112.83	145.34	35.63	52.30
Montana	55.00	77.38	31.73	40.11
Nebraska	84.89	125.16	37.79	58.26
Nevada	75.71	125.04	43.71	57.71
New Hampshire	99.00	132.36	25.88	36.10
New Jersey <sup>a</sup>	94.04	113.26	32.31	42.33
New Mexico	77.62	133.63	39.62	54.34
New York <sup>a</sup>	95.25	102.10	42.32	57.99
North Carolina	59.71	86.16	32.66	44.33
North Dakota	62.54	84.80	26.34	43.17
Ohio	78.78	116.73	35.78	49.42
Oklahoma	180.45	218.63	43.61	60.36
Oregon	69.62	107.44	46.03	60.64
Pennsylvania	73.00	106.21	35.08	47.63
Rhode Island	66.69	84.43	31.85	42.66
South Carolina	52.75	62.75	35.96	43.63

Table 5.3 (continued)

State	Per Day of SNF Care		Per Home Health Care	
	1981	1984/85	1981	1984/85
South Dakota	69.61	82.91	24.89	39.76
Tennessee	66.96	96.47	39.61	56.28
Texas	83.38	119.12	42.38	60.42
Utah	94.73	121.91	26.79	49.20
Vermont	70.80	86.58	24.43	32.15
Virginia	77.33	99.76	35.53	46.14
Washington	70.62	104.78	43.71	55.90
West Virginia	64.34	84.09	34.52	44.88
Wisconsin	77.36	98.19	32.63	42.25
Wyoming	53.39	72.28	31.29	48.20
All states	81.65	113.79	38.71	52.77

<sup>a</sup>Waivered states.

## HOSPITAL AND POSTHOSPITAL CARE: SUBSTITUTES OR COMPLEMENTS?

We saw above that these data do not provide any evidence that SNF care and home health care are either substitutes or complements. Utilization rates for one sort of care do not seem to be correlated with utilization rates for the other. But what about possible substitution or complementarity between inpatient hospital care and posthospital care? More specifically, is there any indication that shorter hospital stays have led to more frequent or more extensive use of posthospital care? In general, the answer to this latter question is no. Let us examine SNF care and home health care separately.

There seems to be no relation between average length of hospital stay in a state and propensity to use SNF care. (See Fig. 5.3. The unweighted correlation coefficient here is  $-0.13$ .) There is, however, a noticeable negative correlation between propensity to use SNF care in a state and average hospital length of stay *for those patients who subsequently use SNF care*. (See Fig. 5.4.) The unweighted correlation coefficient is  $-0.41$ . Thus, there does not seem to be any systematic substitution of SNF care for hospital care; states with a high propensity to use SNF care do not generally have shorter hospital lengths of stay. (It is possible that such an effect is present but simply too small to notice. Only a very few Medicare patients, after all, use SNF care.) It

does appear, though, that the availability of SNF care has an effect on how long patients who eventually use SNF care stay in the hospital. These patients have shorter hospital lengths of stay in states where SNF care is more common, perhaps because the period spent in the hospital waiting for an SNF bed is shorter in these states.

Similar patterns are found in the *changes* in hospital length of stay and *changes* in SNF use. States that showed large decreases in hospital length of stay from the pre- to the post-PPS period did not have large increases in the fraction of patients using SNF care. At the state level at least, shorter hospital stays do not seem to have brought higher SNF use. In contrast, though, states that saw relatively large increases in SNF utilization did have noticeable decreases in average hospital lengths of stay for those patients who eventually used SNF care. The effect of increased use of SNF care seems to have been a reduction in the time that SNF patients spent in hospitals waiting for SNF beds.

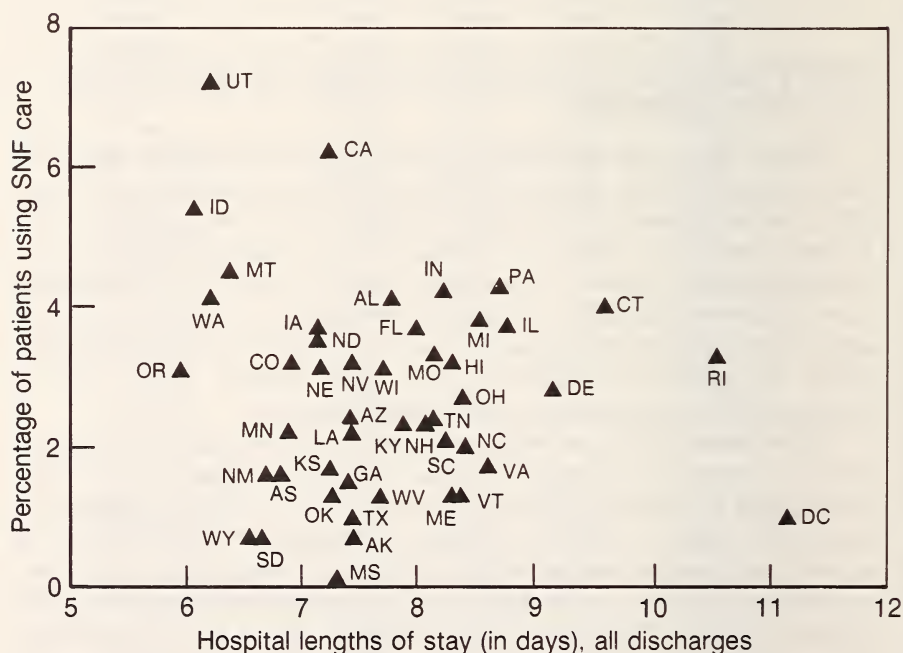


Fig. 5.3—Hospital lengths of stay and propensity to use SNF, 1984/85

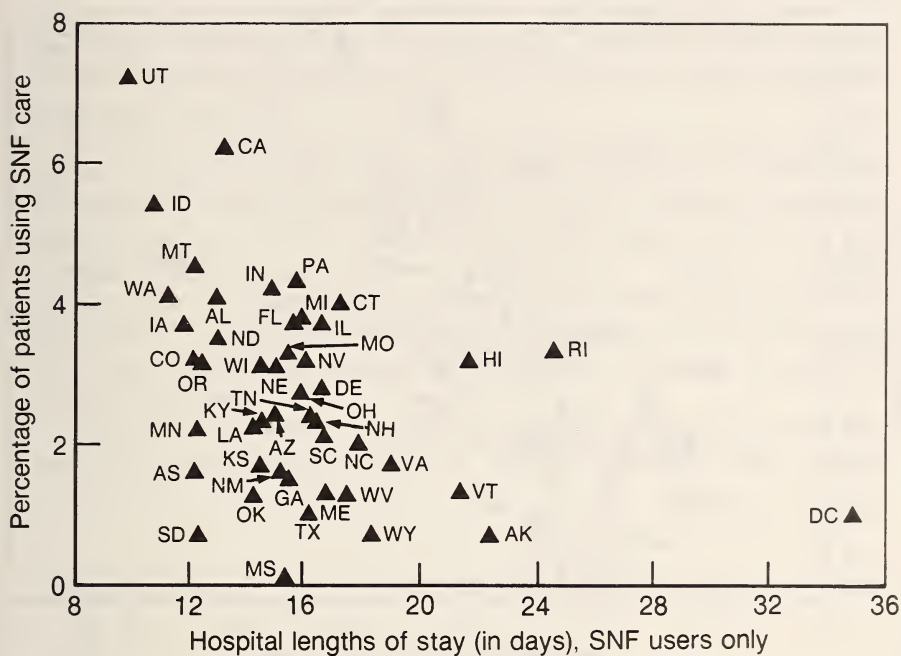


Fig. 5.4—Hospital lengths of stay and propensity to use SNF, SNF users only, 1984/85

Figure 5.5 shows a positive relationship (unweighted correlation coefficient 0.59) in 1984/85 between average hospital length of stay and average SNF length of stay. States with long hospital lengths of stay also had long SNF lengths of stay. Further, there is no apparent relationship between *changes* in hospital lengths of stay and *changes* in SNF lengths of stay. States with large declines in hospital lengths of stay did not have particularly large increases in SNF lengths of stay. Thus, there is no evidence here that shorter hospital stays are resulting in longer SNF stays.

Finally, there is no correlation between changes in hospital lengths of stay and changes in per-day SNF charges. States with large decreases in average hospital length of stay apparently did not see any particular increase in charges for (and thus perhaps in the intensity of) SNF services.



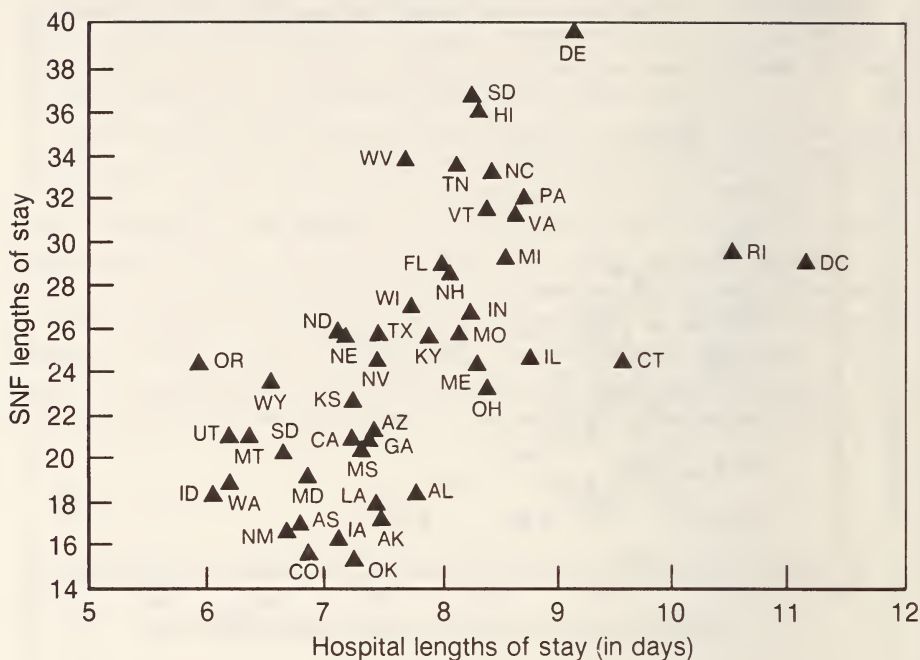


Fig. 5.5—Hospital and SNF lengths of stay, 1984/85

The overall picture that emerges is that greater use of SNF care seems to substitute for hospital care only insofar as it reduces the time that patients spend in hospitals waiting for SNF care. This seems somewhat at variance with some of the results presented above, because it does suggest that availability of SNF care in some states may have constrained its use. There is no evidence here, however, that shorter hospital stays have resulted in either more or more extensive use of SNF care.

The patterns are somewhat different for home health care, but there is still no indication that shorter hospital lengths of stay have resulted in more use of home health services. Indeed, the positive relationship between hospital length of stay and propensity to use home health care suggests just the opposite. (See Fig. 5.6. The unweighted correlation coefficient is 0.42.) States with long hospital lengths of stay tend to

have higher fractions of patients using home health care. An examination of *changes* in hospital length of stay and *changes* in propensity to use home health care shows no relationship. States in which hospitals shortened stays most dramatically did not have the largest increases in home health care use.

In contrast to the SNF case, there is no suggestion that there is a queue of hospital patients waiting for home health care. There is no relationship between hospital lengths of stay for patients who subsequently used home health care and propensity to use home health care. Similarly, there is no relationship between the change in hospital length of stay for subsequent home health care users and the change in propensity to use home health care. Increasing use of home health care does not seem to have shortened waiting times in hospitals for home health care.

There seems to be no relationship between hospital lengths of stay and the average number of home health visits in a state—for all

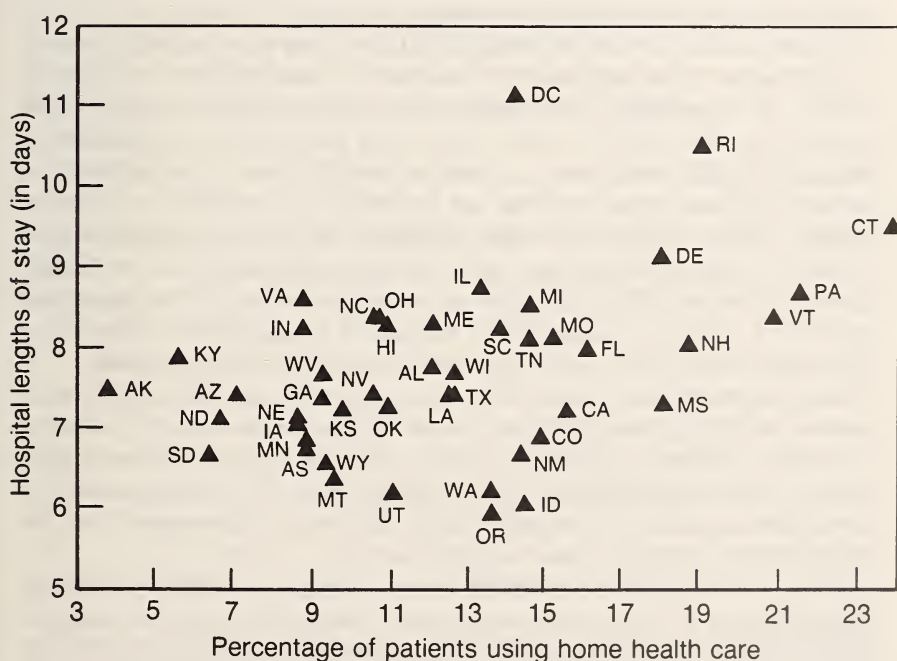


Fig. 5.6—Home health care propensity and hospital lengths of stay, 1984/85

hospital patients or for hospital patients who eventually used home health care. Neither is there any relation between changes in hospital length of stay and changes in number of home health visits. Thus, there is no evidence in these data that shorter hospital lengths of stay have led to more extensive use of home health care.

Finally, there are no relationships between hospital length of stay and per-visit home health charges—either in absolute levels or in changes. Thus, there is no suggestion that shorter hospital stays have resulted in more intensive use of home health care.

## THE EFFECTS OF DIFFERING PATIENT POPULATIONS

The state-to-state variations in posthospital use and charges that are summarized above may reflect differing patterns of medical care—differing ways of treating particular kinds of patients. These variations may arise for a number of reasons. If they reflect variations in quality of care, in the efficiency of care, or in the availability of posthospital services, they may be matters of serious concern to policymakers. Policy adjustments to reduce these variations may be in order.

Variations in patterns of posthospital care may also be due, however, to differences from one state to another in the Medicare population served. We have seen, for example, that women are more likely to use posthospital care than are men, that older patients are more likely to use posthospital care than are younger patients, and that patients in certain DRGs are more likely to use posthospital care than are patients in other DRGs. If the Medicare population differs from state to state in its distribution across sex, age, or diagnostic categories, we might expect variations in posthospital care use patterns. Such variations would be a natural consequence of variations in population characteristics and perhaps not a matter for serious concern to policymakers.

An important issue, then, is how much of the observed variation in posthospital utilization patterns can be attributed to differences in the underlying Medicare population, and how much is due to differing patterns of care for particular groups of patients. The short answer is that differing patient characteristics do not seem to be responsible for much of the variation in posthospital use.

We have attempted to identify the contribution of differing patient characteristics by computing two adjusted versions of relevant statistics (propensity to use posthospital care, amount of posthospital care, etc.) for each state. To compute these adjusted statistics we place each Medicare hospital discharge in our national sample in the appropriate

age-sex-DRG category.<sup>6</sup> We calculate the fraction of all cases in each category and the average value of each of the relevant statistics for the cases in each category. We perform the same assignment of cases and averaging for all of the cases in a particular state. We then use these figures to compute two sets of adjusted statistics.

The first set (using the fraction of patients using home health care as an example) represents the expected fraction of hospital discharges in a state who would use home health care if that state had the national distribution of cases but the state's own propensities to use home health care in each age-sex-DRG category.<sup>7</sup> This adjusted figure represents an estimate of the state propensity to use home health care after correcting for differences in the underlying Medicare patient population. It is badly flawed, however, by the fact that for some states (especially small states) the cell-specific propensities will be highly unreliable, reflecting the experience of perhaps only one or two patients.

We therefore have also made the converse adjustment. We estimate the state propensity to use home health care given the actual distribution of cases in the state but assuming national propensities to use home health care in each cell. This provides an estimate of how different from the national average a state's propensity would be if all differences among states were accounted for by differences in patient population.

If differences in the Medicare patient population are the principal cause of variations in posthospital use patterns across states, then the variance across states of statistics adjusted by the second method should be similar to the variance of the unadjusted statistics. Further, the variance of statistics adjusted by the first method should be much smaller than the variance of the raw statistics.

In fact, we observe just the opposite result. Table 5.4 shows the relevant standard deviations for the nonwaivered states in the 1984/85 period. The table shows both unweighted standard deviations, which give equal weight to each state, and weighted standard deviations, which assign to each state an importance proportional to the number of its Medicare hospital discharges. Notice that the standard deviations of the statistics adjusted by the first method—correcting for differences in patient populations—are very similar to the standard

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<sup>6</sup>There are 5,640 possible categories (six age groups  $\times$  two sexes  $\times$  470 DRGs). In actuality, there are many fewer than 5,640 categories. Many cells are empty. The age groups for this analysis are the same as those used in Table 4.3: under 65; 65-69; 70-74; 75-79; 80-84; and 85 and over.

<sup>7</sup>If a cell is empty for a state, we assume that the propensity to use home health care in that state in that cell is zero.



deviations of the unadjusted statistics. In contrast, the standard deviations of statistics adjusted by the second method—correcting for different patterns of care within a cell—are very much lower than the standard deviations of the unadjusted statistics. We conclude from this that state-to-state variations in posthospital utilization (and in hospital lengths of stay, for that matter) are not to any large degree a reflection of differing underlying patient populations. Rather, they appear to reflect truly different approaches in the treatment of particular kinds of patients.<sup>8</sup> As such, these variations do represent a policy problem: What causes these variations, and which states are “doing things right?”

Table 5.4  
STANDARD DEVIATIONS OF SELECTED STATISTICS

Statistic	Adjusted for Differences in		
	Actual	Patient Population	Patterns of Care
Unweighted			
Percentage of discharges using SNF care	0.0147	0.0150	0.0020
Percentage of discharges using home health care	0.0431	0.0433	0.0034
Average SNF length of stay	6.125	6.793	0.987
Average number of home health visits	2.596	2.616	0.180
Average hospital length of stay	1.065	1.055	0.203
Weighted (by no. of Medicare discharges from acute-care hospitals in each state)			
Percentage of discharges using SNF care	0.0150	0.0143	0.0019
Percentage of discharges using home health care	0.0383	0.0378	0.0034
Average SNF length of stay	5.253	5.363	0.705
Average number of home health visits	2.514	2.549	0.156
Average hospital length of stay	0.754	0.808	0.189

<sup>8</sup>As an additional check, we have performed calculations similar to those presented in Table 5.4 on a DRG-by-DRG basis for six DRGs (14, 89, 127, 209, 210, and 296) that are important for SNF and home health care. These calculations are the same as those reported in Table 5.4 except that there are only 12 cells (six age groups × two sexes). Because there are many cases in each of these six DRGs, there is no problem with empty cells. We have not reproduced the results of these calculations, but they are very similar to the results shown in Table 5.4: State-to-state variations are populations.

## A REFINED NATURAL EXPERIMENT

We noted above that state-to-state variations in care patterns constitute a crude natural experiment, potentially shedding light on how hospital care and posthospital care in different settings complement or substitute for each other. With the adjustments just described, we are in a position to refine that experiment somewhat, correcting for the effects of different underlying patient populations.

We also noted above, however, that differences in patient populations seem to explain very little of observed state-to-state variation. This being the case, we would not expect this refined experiment to produce results that differ in any important respects from the crude experiment described above. For the most part, this has proved to be the case. For the sake of completeness, however, we describe the refinements we have made in our calculations and report the few differences that are apparent between the crude and the refined experiments.

The simplest approach to refining the natural experiment provided by state-to-state variation in care patterns would be to substitute for raw figures in all analyses figures adjusted by the first method described above—that is, figures adjusted for differences in patient populations. We have chosen not to do this, however, because of the unreliability introduced into these adjusted figures by the relatively small number of cases in some states. As an alternative, we have created a measure of how much and in what direction care patterns for particular kinds of patients in each state differ from overall national care patterns. Specifically, for each raw variable we have substituted the ratio of the raw variable divided by the same variable adjusted by the second method described above—that is, the ratio of a state's actual experience to what might have been expected if national patterns of care had been applied to that state's particular patient mix. To return to our example of propensity to use home health care, a finding that the actual fraction of Medicare discharges who use home health care in a state is twice the adjusted value means that twice as many patients in this state use home health care than might be expected if state referral patterns were identical in each age-sex-DRG category to national patterns.<sup>9</sup>

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<sup>9</sup>Because we expected little difference between the crude and refined experiments, we did not in fact repeat all analyses of the crude experiment in the refined experiment. In particular, we did not repeat analyses involving charges per unit of posthospital care or hospital lengths of stay for SNF or home health care users only. The similarity of results between the two experiments in the analyses that were common to both gives us no reason to expect that important differences would have arisen in the omitted analyses.

The general result of refining our analyses of state-to-state variations is to make stronger the generally negative findings of our original crude analyses; a number of the relationships apparent in the crude analyses are eroded in the refined version. In particular, the originally observed positive correlation between propensity to use home health care and the average number of home health visits per user becomes less pronounced in the refined calculations. Also, the positive relationship between SNF length of stay and hospital length of stay disappears completely. Finally, the positive relationship between average hospital length of stay and propensity to use home health care is no longer apparent.

In only one case does a new relationship appear in our refined calculations. This is a pronounced positive correlation between average hospital length of stay and average number of home health visits.<sup>10</sup> Thus, our refined calculations produce some additional evidence against the hypothesis that home health care is substituting for acute hospital care.

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<sup>10</sup>An unweighted regression on the sample of nonwaivered states in 1984/85 produces a correlation coefficient of 0.56. A regression weighted by number of hospital discharges in each state yields a correlation coefficient of 0.62.

## VI. SOME PATIENT-LEVEL ANALYSES

Another way to search for evidence that increased use of posthospital care may be substituting for hospital care is to conduct patient-level analyses. Do patients who use posthospital care seem to have shorter hospital stays than similar patients who do not? The difficulty in this sort of analysis is that available data do not permit us to make sure that the two groups of patients being compared—those who use posthospital care and those who do not—are really similar. We can make comparisons for patients in a particular DRG—DRG 14, stroke, for example—but we cannot at this stage do anything to adjust for the possibility that patients in the two groups suffered strokes of unequal severity or that they experienced different degrees of disability as a result of their strokes. The patient-level analyses reported in this section, then, are far from ideal. They do offer some evidence, nonetheless, that treatment patterns of Medicare patients did change from the pre- to the post-PPS periods.

### HOSPITAL LENGTH OF STAY AND POSTHOSPITAL CARE

The most direct way to approach the issue of substitution of posthospital for hospital care is to regress hospital length of stay on dummy variables reflecting the use of SNF care and home health care. To eliminate some extraneous variation in hospital length of stay, we also include on the right-hand side of these regression equations dummy variables for state and for the age-sex category of the patient.<sup>1</sup> We have carried out this analysis for patients in each of the six DRGs that were most important in accounting for both SNF and home health care in 1984/85: DRG 14 (stroke); DRG 89 (simple pneumonia and pleurisy); DRG 127 (heart failure and shock); DRG 209 (major joint and limb reattachment procedures); DRG 210 (hip and femur procedures, except major joint); and DRG 296 (nutritional and miscellaneous metabolic disorders). We have performed these regressions using both our 1981 and our 1984/85 samples.

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<sup>1</sup>There are 12 age/sex categories (two sexes  $\times$  six age categories). The age categories are the same as those used in the analyses reported in earlier sections of this report: under 65; 65–69; 70–74; 75–79; 80–84; and 85 and over.



Table 6.1 summarizes the results of these regressions, showing the coefficients for the dummy variables indicating SNF use and home health use in each sample. (We do not show coefficients for the state and age-sex dummies.) At first glance, these figures provide no evidence that posthospital care is substituting for hospital care. Indeed, just the opposite seems to be the case; posthospital care and hospital care seem to be complements. Patients who used posthospital care had longer hospital stays than patients who did not. In 1981, patients in DRG 14, for example, who used SNF care stayed 9.09 days longer in the hospital than patients who did not. By 1984/85, the extra length of stay associated with SNF care use dropped to 5.64 days. A similar pattern is apparent for home health care users.

Much of this apparent complementarity no doubt results from our inability to adjust for differences in the severity of patients' conditions within a DRG. Patients who suffer unusually severe strokes are, presumably, more likely to use posthospital care. These patients might also be expected to spend more time in the hospital. The result is an apparent positive correlation between use of posthospital care and hospital length of stay.

More interesting, however, is the change in the coefficients from 1981 to 1984/85. For all six of these DRGs, the additional hospital lengths of stay associated with use of SNF and with use of home health care decline from the pre- to the post-PPS periods. In all cases, this decline is significant at the 5 percent level. Our inability to correct for severity may be masking some substitution of posthospital care for hospital care. It does not, however, mask the fact that there was a marked movement in the direction of substitution of posthospital care for hospital care from the pre- to the post-PPS periods, just the sort of behavior that one might have expected to result from the institution of the PPS.

## **HOSPITAL LENGTH OF STAY AND THE EXTENT OF POSTHOSPITAL CARE**

We might pursue further the issue of substitutability of posthospital for hospital care by asking whether patients who use a lot of posthospital care have different lengths of hospital stays from patients who use only a little. Tables 6.2 and 6.3 are similar to Table 6.1 in that they show selected coefficients from a set of regressions. As before, the dependent variable is hospital length of stay. The independent variables, however, now include measures of the extent of posthospital care used. For SNF care, these measures are the number of covered days of

Table 6.1

REGRESSION RESULTS OF HOSPITAL LENGTH OF STAY  
AND USE OF POSTHOSPITAL CARE

		Coefficients for Dummy Variables	
DRG	Date	SNF Use	Home Health Use
DRG 14			
Specific cerebrovascular disorders, except transient ischemic attack	1981	9.09	5.78
	1984/85	5.64	2.00
DRG 89			
Simple pneumonia and pleurisy	1981	7.44	4.08
	1984/85	4.13	2.55
DRG 127			
Major heart failure and shock	1981	8.27	3.26
	1984/85	5.62	2.10
DRG 209			
Major joint and limb reattachment procedures	1981	1.68	2.93
	1984/85	0.43	1.23
DRG 210			
Hip and femur procedures, except major joint	1981	1.02	2.97
	1984/85	0.48	1.13
DRG 296			
Nutritional and miscellaneous metabolic disorders	1981	7.62	2.35
	1984/85	4.49	1.51

NOTES: All coefficients are significantly different from zero at the 5 percent level. All changes in coefficients from 1981 to 1984/85 are significant at the 5 percent level. Dependent variable: hospital length of stay, in days. Sample: all Medicare hospital discharges in DRG, nonwaivered states. Additional independent variables: state and age-sex dummy variables.

SNF care and covered charges per day of care. The corresponding variables for home health care are the number of covered home health visits and covered charges per visit. As before, state and age-sex dummy variables are also included on the right-hand side of the estimated equations. Unlike the regressions reported in Table 6.1, however, the samples for these regressions include only those patients who used SNF care (Table 6.2) or home health care (Table 6.3). Finally, we include in the regression for each type of posthospital care a dummy variable denoting patients who used the other type of posthospital care as well.

Table 6.2

REGRESSION RESULTS OF HOSPITAL LENGTH OF STAY  
AND THE EXTENT OF SNF CARE

		Estimated Coefficients		
DRG	Date	SNF Days	Covered Charges per Day	HHA Use Dummy
DRG 14				
Specific cerebrovascular disorders, except transient ischemic attack	1981	0.06 <sup>a</sup>	0.01 <sup>a</sup>	-1.57 <sup>a</sup>
	1984/85	0.03 <sup>a</sup> (b)	0.00 (b)	-1.98 <sup>a</sup>
DRG 89				
Simple pneumonia and pleurisy	1981	0.05 <sup>a</sup>	0.03 <sup>a</sup>	1.26
	1984/85	0.02 <sup>a</sup> (b)	0.00 (b)	0.15
DRG 127				
Major heart failure and shock	1981	0.05 <sup>a</sup>	0.02 <sup>a</sup>	-3.15
	1984/85	0.05 <sup>a</sup> (b)	0.00 (b)	-0.91
DRG 209				
Major joint and limb reattachment procedures	1981	0.08 <sup>a</sup>	0.00	0.75
	1984/85	0.05 <sup>a</sup> (b)	0.00	0.20
DRG 210				
Hip and femur procedures, except major joint	1981	0.03 <sup>a</sup>	0.01 <sup>a</sup>	0.17
	1984/85	0.02 <sup>a</sup>	0.004 <sup>a</sup>	0.07
DRG 296				
Nutritional and miscellaneous metabolic disorders	1981	0.03	0.03 <sup>a</sup>	-1.24
	1984/85	0.01	0.00 (b)	-0.77

NOTES: Dependent variable: hospital length of stay, in days.  
Sample: all Medicare hospital discharges in DRG using SNF care,  
nonwaivered states. Additional independent variables: state and age-  
sex dummy variables.

<sup>a</sup>Coefficient significantly different from zero at the 5 percent level.

<sup>b</sup>Changes in coefficients from 1981 to 1984/85 significant at the 5  
percent level.

Table 6.2 shows the same general relationship between SNF care and hospital length of stay that was apparent in Table 6.1, although neither the coefficients themselves nor the changes in them are as uniformly significant in Table 6.2 as in Table 6.1. Patients who used

more SNF care and more expensive SNF care tended to have longer hospital lengths of stay. As before, this is presumably at least partly due to our failure to correct for severity of illness. Also as before, though, the degree of this apparent complementarity declines from the pre- to the post-PPS periods, suggesting again a new tendency to substitute SNF care for hospital care. Exactly the same message, regarding home health care, is conveyed by Table 6.3.

Table 6.3

REGRESSION RESULTS OF HOSPITAL LENGTH OF STAY  
AND THE EXTENT OF HOME HEALTH CARE

DRG	Date	Estimated Coefficients		
		HHA Visits	Covered Charges per Visit	SNF Use Dummy
DRG 14				
Specific cerebrovascular disorders, except transient ischemic attack	1981	0.15 <sup>a</sup>	0.06 <sup>a</sup>	2.07 <sup>a</sup>
	1984/85	0.06 <sup>a</sup> (b)	0.01 <sup>a</sup> (b)	2.14 <sup>a</sup>
DRG 89				
Simple pneumonia and pleurisy	1981	0.09 <sup>a</sup>	0.03 <sup>a</sup>	4.67 <sup>a</sup>
	1984/85	0.03 <sup>a</sup>	0.00 (b)	1.99 <sup>a</sup> (b)
DRG 127				
Major heart failure and shock	1981	0.09 <sup>a</sup>	0.03 <sup>a</sup>	3.50 <sup>a</sup>
	1984/85	0.05 <sup>a</sup> (b)	0.01 <sup>a</sup> (b)	2.65 <sup>a</sup>
DRG 209				
Major joint and limb reattachment procedures	1981	0.14 <sup>a</sup>	0.05 <sup>a</sup>	0.21
	1984/85	0.06 <sup>a</sup> (b)	0.01 <sup>a</sup> (b)	-0.33
DRG 210				
Hip and femur procedures, except major joint	1981	0.10 <sup>a</sup>	0.05	-1.29
	1984/85	0.04 <sup>a</sup> (b)	0.00 (b)	-0.26
DRG 296				
Nutritional and miscellaneous metabolic disorders	1981	0.14 <sup>a</sup>	0.02	4.46 <sup>a</sup>
	1984/85	0.04 <sup>a</sup> (b)	0.01 <sup>a</sup> (b)	2.28 <sup>a</sup> (b)

NOTES: Dependent variable: hospital length of stay, in days. Sample: all Medicare hospital discharges in DRG using home health care, nonwaivered states. Additional independent variables: state and age-sex dummy variables.

<sup>a</sup>Coefficient significantly different from zero at the 5 percent level.

<sup>b</sup>Changes in coefficients from 1981 to 1984/85 significant at the 5 percent level.



## VII. CONCLUSIONS

The analyses described in this report represent our attempts to approach from a number of different directions questions about the possible impact of the Medicare prospective payment system on patterns of posthospital care. In most cases, the available evidence is suggestive rather than conclusive. A number of patterns seem to show up repeatedly, though, and in this final section we attempt to summarize what we have learned.

First, patterns of both hospital and posthospital care have changed since the introduction of the PPS. Hospital lengths of stay have become shorter, and more patients are using posthospital care. Medicare patients using SNF care are using less of it (or at least Medicare is paying for less of it), but patients using home health care are using more. It is impossible at this stage to say to what degree these changes were caused by the PPS; other changes in the Medicare benefit and in the U.S. health care system more generally have no doubt also contributed.

These overall changes are observable in most of the DRGs that are important in accounting for posthospital care. These changes are not apparent in all states, however, and the already wide variation among states in posthospital care patterns and costs has, if anything, increased since the introduction of the PPS. Differences among states in the age, sex, and DRG distributions of the Medicare hospital population explain very little of the variations in posthospital use and costs. These variations apparently reflect real underlying differences from one state to another in the ways that particular classes of patients are treated. As such, these variations represent a problem for policymakers. Are care patterns in some states "better" in some sense than in others? If so, what policies will encourage or enable all states to adopt such patterns?

Our analyses lend support to some widely held views. They suggest, for example, that limited availability is an important constraint on the use of SNF care in some states. States that saw large increases in the fraction of patients using SNF care also saw large decreases in hospital lengths of stay for patients who subsequently used SNF care. This is consistent with the hypothesis that in many states there is a queue of patients in hospitals waiting for SNF beds to become available. With increasing SNF availability, SNF use rises, and in-hospital waiting periods decline. It is also consistent with increased use of SNF care by

"marginal" patients—patients who in the pre-PPS environment would have remained in the hospital until they were able to go home. For these "marginal" patients, SNF care may be substituting for the last few days of hospital care, and it is in states where SNF care has increased the most that the associated reduction in hospital lengths of stay is most pronounced.

We do not see a similar relationship between home health care use in a state and the average lengths of hospital stays for patients who subsequently used home health care. Thus, our analyses do not suggest that availability is an important determinant of the level of home health care use. This is consistent with the widespread belief that home health care is generally available when it is needed by Medicare patients.

On other issues, our analyses seem to be somewhat at odds with popular views. It is clear that Medicare patients are being discharged from acute-care hospitals "quicker." Our data do not allow us to assess directly whether these patients are in any meaningful sense also "sicker." We have no information, for example, on the intensity of nursing or home health services that these patients require or are receiving. Our data do suggest, however, that the character of Medicare-reimbursed posthospital care—and particularly SNF care—may be changing. Posthospital care seems to be becoming less "chronic" and more "routine" and "acute." Certainly, more posthospital care is being used by Medicare patients. The number of days of SNF care and the number of home health visits *per hospital discharge* have both risen. The average number of covered days of care for each patient who actually uses SNF care has declined, and the "additional" SNF users in the post-PPS period are concentrated at the lower end of the SNF length-of-stay distribution, needing (or at least using) relatively few days of SNF care. This suggests that hospitals are increasingly willing and able to discharge "marginal" patients (in the sense described above) to SNF care. We have also noted that both the fraction of SNF patients who are readmitted to hospitals and the fraction of Medicare patients who die while in SNFs have declined in the post-PPS period. For both SNF and home health care, the largest increases in the propensity to use posthospital care are observed among the youngest groups of Medicare patients, also consistent with the hypothesis that posthospital care is becoming a more routine part of care patterns rather than something reserved exclusively for the "most frail" hospital discharges.

Finally, on the important issue of whether or not increased use of posthospital care is substituting for the last few days of hospital care, our evidence is mixed. At a state level, we can find no overall relation

between average hospital length of stay and the use of SNF care. If SNF care is substituting for hospital care, the effect is too small to detect at the level of the state. As we have seen, however, hospital lengths of stay *for patients who actually use SNF care* have declined most in states where use of SNF care has increased the most. This is consistent with hospital success at substituting SNF care for the last few days of hospital care in at least some cases. We find a *positive* relationship between average length of stay and use of home health care, suggesting—somewhat improbably—that home health care is a complement to hospital care. At the patient level, our results are muddied by our inability to adjust for severity of illness within particular DRGs and we observe that patients who use posthospital care have, on average, longer hospital stays than patients who do not. (“Sicker” patients in any DRG are more likely to use posthospital care and are likely to stay longer in the hospital.) This positive relationship is significantly weaker in the post-PPS period, however, and this may reflect some substitution of posthospital care for hospital care.



## Appendix

### EPISODES OF CARE

In linking together records of hospital and posthospital care, we have sought to create records for complete "episodes" of care beginning with a stay in a short-stay, acute-care hospital. Ideally, an "episode" will include all care covered by the Medicare Part A benefit related either to treatment of the complaint that brought about the original hospitalization or to conditions that developed as a result of care given during the original hospitalization.

We necessarily fall short of this ideal for a number of reasons. First, because our records of posthospital care contain little or no diagnostic information, it is sometimes difficult unambiguously to associate care in a posthospital setting with a specific episode of acute hospital care. (This is generally not a problem with SNF care, but it is a potentially severe problem with home health and rehabilitation care.) Second, we have no way of knowing if a readmission to a hospital is for further treatment of the original condition or for treatment of an entirely new complaint. If the former, the second hospital stay should be considered a part of the original episode. If the latter, the second stay should not be counted. Unfortunately, we cannot distinguish between these two cases. Third, our data allow us to identify posthospital care provided to a patient only during the half year following his discharge from an acute-care hospital. Relevant posthospital care provided after that date is not counted.

Given these constraints, any definition of an episode of care must be at least somewhat arbitrary. In constructing episodes of care for this work, we have used current Medicare regulations as a guideline, but some arbitrariness remains. Rather than basing all our analyses on a single, necessarily arbitrary, definition of an episode of care, we have devised two definitions, and we have conducted many of our analyses using both definitions.

We have termed these definitions our "maximalist" and our "extended" definitions.<sup>1</sup> These two definitions differ only in their

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<sup>1</sup>These somewhat unfortunate names derive from earlier work in this area. (See C. R. Neu et al., *Extending the Medicare Prospective Payment System to Posthospital Care: Planning a Demonstration*, The RAND Corporation, R-3335-HCFA, May 1986.) In this earlier work, the "maximalist" definition was so called to distinguish it from a more limited "minimalist" definition. In the course of this work, we recognized a need for a broader definition of a care episode. The "extended" definition is the result.



treatment of home health care. In the rest of this summary, we detail how care in each possible setting was treated in each definition of an episode.

*Acute Hospital Care.* Both definitions include all acute hospital care covered by Medicare. Because we cannot distinguish between hospital readmissions that are related to the original hospitalization and readmissions that are not, both definitions recognize any readmission to an acute-care hospital as the end of one episode of care and the beginning of another.

*SNF Care.* Current Medicare regulations require that to qualify for SNF care a patient must have at least a three-day "qualifying" stay in an acute-care hospital. Further, the regulations require that SNF care be for the treatment of the same condition that required the original hospitalization and that (with some exceptions) SNF care begin within 30 days of hospital discharge. Finally, Medicare coverage for SNF care is limited to 100 days in any "benefit period." A benefit period begins when a Medicare patient is admitted to a hospital and ends when a patient has been out of both hospitals and nursing homes for 60 days.

Fortunately, Medicare SNF billing records report the "qualifying" hospital stay associated with each SNF stay, and we can therefore link each SNF stay to the appropriate hospital stay. In both definitions of an episode of care, we include all SNF care up to the 100-day maximum, with only the proviso that SNF care begin within 30 days of hospital discharge. We do not include SNF care in the very few cases in which it commences more than 30 days after hospital discharge.

*Home Health Care.* Since mid-1981, there has been no requirement for a "qualifying" hospital stay preceding home health care. Thus, there is no certainty that an episode of home health care is in any way related to the most recent hospital stay. Neither do home health care billing records contain any diagnostic information that would allow related hospital and home health care episodes to be identified. In mid-1981 also, limits on the maximum number of covered home health visits were abolished, and there is therefore no natural cut off for home health care associated with a particular hospital episode.

In both definitions, we have chosen to associate home health episodes with the most recent previous hospital stay, as long as no more than 60 days had elapsed between hospital or SNF discharge and the beginning of home health care. This limit of 60 days is suggested by the current definition of a Medicare benefit period. A new benefit period begins when a patient has been in neither a hospital nor an SNF for 60 days. The maximalist definition of a care episode includes all home health care that occurs within the 60 days following the last discharge from a hospital or an SNF. The extended definition includes

all home health care provided within 190 days of *hospital* discharge. (This limit of 190 days is also suggested by the current definition of a benefit period. A benefit period could conceivably last for 190 days after discharge from an acute-care hospital: 30 days before SNF care begins plus 100 days of SNF care plus 60 days out of both hospital and SNF.) A limit of 190 days is also consistent with data available for this research: We could identify posthospital care provided within a half year of hospital discharge.

*Rehabilitation Care.* In the 1984/85 sample it is possible to identify care in rehabilitation hospitals and rehabilitation units that were exempt from the provisions of the PPS. Since most rehabilitation is in fact post-acute care, we have included rehabilitation care in our episodes of care in the 1984/85 sample. In both definitions, we associate rehabilitation care with the most recent preceding acute hospital stay as long as rehabilitation care begins within at least 60 days of acute-care hospital discharge. In both definitions, we include all covered days of rehabilitation care that are provided within 190 days of acute-care hospital discharge.

The first part of the paper discusses the importance of the study of the history of the English language. It is pointed out that the English language has a long and varied history, and that it is important to understand the changes that have taken place over time. The second part of the paper discusses the importance of the study of the history of the English language. It is pointed out that the English language has a long and varied history, and that it is important to understand the changes that have taken place over time. The third part of the paper discusses the importance of the study of the history of the English language. It is pointed out that the English language has a long and varied history, and that it is important to understand the changes that have taken place over time.

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